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TRANSACTIONS

OF THE

EPIDEMIOLOGICAL SOCIETY

OF

LONDON.

VOL. I.

LONDON:
JOHN W. DAVIES, 54, PRINCES STREET,
LEICESTER SQUARE.

M.DCCC.LXIII.

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PREFACE.

A SOCIETY founded for the improvement of our knowledge of epidemics, or of any other class of diseases, may hold periodical meetings; may read and discuss papers, nominate committees for special investigations, and form a library of appropriate works; yet, having done all this, it has only, after all, been endeavouring to add to the information of those who have joined its ranks—an infinitely small number, even in the most flourishing society, as compared with that of the profession at large.

Something more is needful to render its efforts generally useful, and entitle it to the character of an association which is labouring for the promotion of the public good.

That something is the publication of its Transactions. Thus, and thus only, can it directly impart to others the facts which its members have ascertained, the views which they have formed, and add them to the common stock of professional knowledge.

It is this crowning act which gives a scientific society a claim upon the public, and enables its members emphatically to say to the world, "We are working, not selfishly for ourselves alone, but for you also."

The Epidemiological Society, scanty as its funds have been, has never from the first lost sight of the necessity for publication; and, in order to meet it, at least in some measure, the Council have all along supplied the medical journals with abstracts of the

papers read at the monthly meetings. Latterly, they did more, for they made an arrangement with the proprietor of the *Sanitary Review*, according to which a portion of that journal was set apart for the publication of the Society's Transactions.

The former expedient, courteously acceded to by the editors of the *Lancet*, *Medical Times*, and *British Medical Journal*, is obviously, however useful, inadequate to our purpose; for an abstract of a paper can never give more than a general notion of its contents; while the latter, owing to a discontinuance of the *Review* itself, has ceased to be available.

After much consideration, therefore, the Council have come to the determination, which a rigid economy has rendered feasible, that the Society shall undertake for itself the publication of its Transactions.

A selection of materials from the papers which have been read at the monthly meetings is intrusted to a committee, and it is intended, without any definite limitation as to period or quantity, to put forth, from time to time, a volume, or part of a volume, as may be found convenient.

The following pages are the first results of this determination; and it is hoped that they will be received by the profession in the same spirit in which they are offered by the Society—namely, that of a desire to benefit the public at large by the promulgation of reliable facts and sound views on a subject so interesting as a matter of scientific investigation, and of such practical importance.

B. G. B.

EPIDEMIOLOGICAL SOCIETY,

FOR THE INVESTIGATION OF

EPIDEMIC DISEASES.

INSTITUTED AUGUST 1850.

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OF THE

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FOR THE SEASON 1860-61.

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EPIDEMIOLOGICAL SOCIETY.

In submitting to the Medical Profession and to the public a brief exposition of the objects to which the investigations of the Epidemiological Society will be more especially directed, the Council are desirous of explaining the chief circumstances which have led to the formation of the Society.

Among the foremost of these may be placed the fact, that Epidemic diseases extensively prevail in all parts of Great Britain and Ireland; causing, as the various inquiries instituted of late years by the Government, and the trustworthy records of the Registrar General, equally shew, a very large annual mortality. In illustration of this position, it may suffice to state, that the yearly average number of deaths in England alone, from Zymotic affections, in the five years 1838-42, amounted to 67,345, or 19 per cent. of the total annual mortality from all specified causes:* whilst, as far as London is concerned, the deaths from Zymotic diseases in 1848 amounted (exclusively of the Cholera deaths in that year) to 17,634,—a number exceeding by 3,033 the total deaths in the Metropolis from Cholera during the whole of the late Epidemic.

The continued existence of that loathsome pestilence, Small Pox, in the very country where a most powerful, if not, as many high authorities contend, a perfect preventive, had its origin, calls loudly for more strenuous and efficient measures than have hitherto been adopted for the eradication of this fatal scourge, which year by year still carries off thousands of victims, reduces many unhappy persons, and especially children,

* Seventh Annual Report of the Registrar General, p. 62.

to a state of incurable blindness, and inflicts upon a still greater number an unsightly disfigurement. So far as the mortality is concerned, it appears that in the eight years from 1840 to-1847, inclusive, there died of small-pox in the Metropolis alone, 7039 persons, giving an annual mortality of 879; whilst in England during five years (1832-42) the total deaths from the same cause amounted to 44,916, being a yearly average of 8,983 deaths.

These and similar facts shew, what is either not sufficiently known or not properly estimated by the public at large, that the ordinary Epidemics of this country—Measles, Scarlatina, Hooping Cough, Typhus, &c.—are constantly and actively prevalent; that although they may occasionally break out in different localities with unwonted force, so as to attract in those places special attention, they never cease to ravage the community; that, viewed collectively, the mortality they thus inflict greatly exceeds that arising from occasional and less familiar pestilences, as Influenza and Cholera; and that, consequently, although the popular notice is chiefly fixed on these last named visitations, the welfare of all, but especially of the productive classes, urgently demands that those who, from their position, are called upon to guard the public health,—the Legislature, the Government, and the Medical Profession,—should zealously enter upon the inquiry, how evils of such magnitude may most effectively be controlled.

Even as regards that fearful epidemic, Cholera, from which we have lately been relieved, the Council perceive no such guarantee for future immunity as would justify any further delay in entering upon a comprehensive investigation of all the circumstances connected with this fatal disease, which, since 1831, has several times revisited European countries.

Before concluding these preliminary remarks, the Council are desirous of correcting an error which they have reason to believe somewhat extensively prevails, respecting the diversity of opinion which is assumed to exist among the members of the

Medical Profession, on the subject of Epidemic diseases. That there are conflicting views upon some points, and especially upon the question of contagion, is fully admitted; but it deeply concerns the public welfare that it should be well understood, that all practitioners are completely in accord as to the noxious influence of certain manifold and potential sources of unhealthiness prevalent in populous places, as overcrowding, defective ventilation, bad drainage, and other similar defects; and that, consequently, with some few exceptions, for the most part relating to questions of international communication, they are agreed as to practical measures of improvement.

The Council would further express their conviction, that were the powers of Medicine and the resources of Art fully realised and applied, mankind would be rescued from a large part of those evils which they at present experience from the almost unmitigated violence of various Epidemic diseases. The fact that many of the most destructive of these pestilences, which in former ages swept away millions of the inhabitants of Europe, have yielded before the advance of civilisation, so as now only to exist in the pages of the medical historian, justifies, it is submitted, the opinion here expressed, and, at the same time, holds out the best encouragement for future exertion.

In conclusion, the Council earnestly solicit the zealous co-operation of all those who can in any way aid in the realisation of objects so deeply concerning the interests of all classes of the community. To the Members of the Medical Profession they appeal, with the confident assurance that they will with alacrity contribute those facts by which alone the laws of Epidemic diseases can be established, thus laying the only safe foundation for practical ameliorations.

From the Clergy, who both in populous towns and rural districts have hitherto been but the too frequent spectators of suffering, physical and moral, arising from fevers and other allied affections, the Council hope to receive the valuable information they are so well calculated to contribute.

OBJECTS OF THE EPIDEMIOLOGICAL SOCIETY.

The object of the Epidemiological Society is stated comprehensively in the first section of the Laws, to be "the Investigation of Epidemic Diseases," but it has been considered by the Council that a more detailed statement of the ends which it is desired to attain would be acceptable to the members of the Society at large.

It may be stated that the Society purpose—To institute a rigid examination of the causes and conditions which influence the origin, mitigation, prevention, and treatment of Epidemics—to collect and promulgate, with relation thereto, such facts as appear to be established on sufficient evidence—and to point out those methods of investigation by which the misleading influence of false or deficient evidence may be best avoided.

To institute in this spirit of careful inquiry, original and comprehensive researches into the nature and laws—of diseases connected with soil and climate, of which ague, remittent, and yellow fevers offer good examples—of Epidemics, such as typhoid fever, prevailing in towns, villages, or rural districts; in public institutions, as workhouses, prisons, lunatic asylums, and hospitals; in ships, barracks, and encampments—of Epidemics, like cholera, appearing in a locality and spreading thence to distant countries—of the eruptive fevers, as scarlatina. It is proposed that such inquiries should include all that relates to overcrowding, to errors of construction affecting the light and ventilation of buildings, to deficient supply of water, to imperfect cleansing and drainage, and to insufficiency of food and clothing.

In order to throw light upon the whole question of Epidemic diseases, and as an object in itself of important inquiry, it will be within the scope of the Society to investigate the diseases prevailing extensively among domestic and other animals, as well as those that affect the vegetable kingdom.

Immediately on the ontbreak of an Epidemic in any place, the Society will consider it its special province to institute a searching inquiry, tracing with scrupulous minuteness the history of the first cases.

In the investigation of Epidemic diseases the aim will be, to trace them up to their causes, to examine such causes thoroughly, and to ascertain whether they admit of prevention, and if so, by what means.

The spread of Epidemics will form another subject of inquiry; and under this head, the influence of isolation and of unrestrained intercourse will be particularly investigated.

It will be a further part of the Society's province to ascertain the operation of existing legal enactments which bear upon Epidemic diseases—such as those which relate to quarantine; to vaccination; to the sale of unwholesome or adulterated food; and to the removal of nuisances—to inquire into the defects of these enactments, and point out such alterations as may be necessary for the protection of the public health. The Society also propose to communicate with the Government and Legislature on matters connected with the prevention of Epidemic diseases.

The inquiries will be conducted by Committees of the Society, by individual members, and, where advisable, by paid agents; and in the same way it is proposed that scientific and experimental researches be undertaken into chemical, meteorological, and other influences, bearing upon Epidemic diseases—apparatus being supplied for such researches.

To arrive at a satisfactory knowledge of the general laws regulating Epidemic diseases, an intimate acquaintance with the rise, progress, phenomena, and decline of past or of extinct Epidemics will be essential, so that, at some future period, the Society may be enabled to present a comprehensive history of the various Epidemics which have from time to time invaded different portions of the globe.

The Society [illegible] tive and organised co-operation of Government [illegible] Corporate bodies, Public Institutions, and M[illegible] nd will invite the formation of co-operating s[illegible] d in this country, grafting the latter, when pr[illegible] ing medical societies.

Lastly, it is [illegible] receive, to read at their Meetings, and to p[illegible] pers and communications—to issue queries—[illegible] s—to form statistical tables—to prepare illu[illegible] l to collect works relating to Epidemic disea[illegible]

The Ordinary [illegible] Society will be held at the [illegible] of the

ROYAL [illegible] BENEVOLENT COLLEGE,

37, SOHO SQUARE,

ON THE FIRST MONDAY OF EACH MONTH, FROM NOVEMBER TO JULY INCLUSIVE. THE CHAIR WILL BE TAKEN AT EIGHT P.M. PRECISELY.

Subscriptions and Donations may be paid to the Treasurer, Bankers, or Secretary. The Annual Subscription of Resident Members is One Guinea. Non-Resident Members pay One Guinea on election; but they are not called upon for any further Contribution.

The Rules and Regulations of the Society, with an Exposition of its Objects, may be obtained on application to DR. MCWILLIAM, 14, *Trinity Square, E.C., to whom also Papers and Communications are to be addressed.*

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EPIDEMIOLOGICAL SOCIETY.

Monday, November 7th, 1859.

ON the occasion of the inauguration of this, the tenth Session of the Epidemiological Society, DR. BABINGTON, the President, delivered the following Address:—

GENTLEMEN,—When this Society was first established, in 1850, I had the honour, on the 2nd of December of that year, to deliver before you an opening Address, setting forth the objects which we proposed to ourselves on its formation. These I stated to be, "to endeavour, by the light of modern science, to review all those causes which result in the manifestation and spread of epidemic diseases—to discover causes at present unknown, and investigate those which are ill understood—to collect together facts on which scientific researches may be securely based—to remove errors which impede their progress, and thus having, as far as we are able, made ourselves thoroughly acquainted with the strongholds of our enemies, and their modes of attack, to suggest those means by which their invasion may either be prevented, or, if in spite of our exertions they may have broken in upon us, to seek how they may be most effectually combated and expelled."

At the opening of the second Session, on November 3rd, 1851, I again addressed you, and now it became my duty to give you some account of what had been done by us, and I took occasion to add to the general report of the papers read, and of the proceedings of various committees, a few observations with regard to our future operations and prospects.

Again, at the commencement of the third Session, on Nov. 1st, 1852, I accompanied the general report of past proceedings with observations somewhat more copious than those of the preceding year, and of a more general character.

You had thus heard my voice for three successive years, I fear *usque ad nauseam*, so, in order to relieve you from its monotony, and give some variety to the inauguration of the fourth Session, it suggested itself to me that it would be agreeable to all parties if I requested some other member of our body to deliver an opening address, and you will all remember how eloquently and efficiently Mr. Grainger fulfilled the duty thus confided to him. On the following year Dr. Bird kindly undertook a similar task, and performed it with equal ability. How it happened that we did not continue this plan I hardly know. It seemed, however, by common consent, to be thought best that we should content ourselves for the future with a mere examination of the papers read, together with an abstract account of the proceedings of committees, and then proceed on our first meeting, as on any other, to carry out the object of our assembling, by the reading of some paper. Such has continued to be the practice for the last three years; and from the very able manner in which our excellent Secretary, Dr. McWilliam, has, as it were, been my prompter behind the scenes, and furnished me with materials, I have really had little else to do but to read to you the report which he has with so much greater ability, and with so much more knowledge of the subject than myself, drawn up.

On the present occasion, however, I think it necessary formally to apprise you that he has done much more, having not only furnished an enumeration of the papers read last Session, but having given, in addition, an elaborate and most valuable account of the state of epidemic diseases as they have existed for the past year in various parts of the world. Now, although this account is drawn up in the form of an address, and, therefore, without these prefatory remarks, would appear to be my own, I can by no means consent thus to appear in borrowed plumes, and gain credit not belonging to me by

seeming to be the author of what I am about to read to you. To our Secretary is due the praise, and we shall all, I am sure, agree in the sentiment, "Palmam qui meruit ferat."

On Monday, Nov. 1st, 1858.—A paper entitled "Illustrations of the Mode of Propagation of certain Epidemic Disorders," by Dr. Barker, of Bedford; was read by the Author.

On Monday, December 6th, 1858.—A paper on "Epidemic Throat Affection, or Diphtheria," by Dr. Draper McKinder, of Gainsborough; was read by Dr. McWilliam.

On Monday, February 7th, 1859.—A paper "On the Causes of Continued Fever, with special reference to the recent Windsor Epidemic," by Dr. Charles Murchison; was read by the Author.

On Monday, March 7th.—A paper "On the Advantages to be derived from a more extensively organised system of Sanitary Supervision," by H. J. Payne, Esq., of Cardiff; was read by the Author.

On Monday, April 4th, the following communications were read:—I. "An Account of an Epidemic of Diphtheria," by Dr. Burdon Sanderson; was read by the Author.

II. "Some Account of Diphtheria, as it occurred in Bengal in 1833," by Dr. Jackson, of H.M. Indian Medical Service (communicated by Dr. Murchison): and a paper on "Diphtheria on board H.M.S. *Cumberland*, at Rio Janeiro, in 1857," by Dr. Alex. Eugene MacKay, Staff Surgeon, R.N.; were read by Dr. McWilliam.

On Monday, May 2nd.—A paper "On the Successive Epidemics of Yellow Fever among the Garrison at Bermuda," by Dr. Milroy; was read by the Author.

On Monday, June 6th.—A paper entitled "Practical Remarks on Cholera Morbus: its origin, nature, and treatment," by H. Cameron, Esq., H.M. Indian Forces; was read by Dr. McWilliam.

The Society (our Secretary proceeds to say) cannot but feel a deep interest in the labours of its Corresponding Members abroad, more especially in our colonies; and in efforts made by them for the prevention of disease, and the improvement of

public health. There are few, if any places, that stand more in need of such efforts than our West India islands, and certainly none among these more than Jamaica, the largest and most important of the group. The great amount of sickness and mortality in all seasons among its working population, and the frequent visitation of destructive epidemics, are among the chief causes of this fine island's decay. These have been shown to be in no inconsiderable a degree owing to causes which are capable of being abated or removed, but which the neglect of public hygiene serves to perpetuate. In the hope of inducing the colonial authorities to compel the island government to adopt a more enlightened policy for the correction of many notorious abuses, and the prevention of much sickness and death, Dr. Bowerbank came to this country at the beginning of the present year, and he has only recently returned to Jamaica. His exertions, although not countenanced by official favour, will, it is believed, be productive of good to the colony. The Board of Lunacy Commissioners, presided over by the Earl of Shaftesbury, evinced the most lively interest in his exertions to improve the condition of the insane in Jamaica.

In Antigua there was an epidemic of yellow fever in the latter part of last, and the beginning of the present, year.

In Trinidad there was a destructive yellow fever epidemic among the garrison in the early part of this year. The troops had to be encamped at a distance from the barracks, and part of them were sent to Barbadoes. As on most former visitations of this pestilence in Trinidad, as well as in other West India islands, the pernicious influence of local causes of insalubrity in and around the barracks and cantonments, was, upon examination, at once recognized by the medical officers.

Until a thorough and minute inspection of every barrack in our West India possessions shall have been made, we must be prepared to hear, from time to time, of such occurrences as have within the last few years cost the lives of so many of our soldiers, from epidemics, in Jamaica, Bermuda, Trinidad, and elsewhere.

Yellow fever seems now to be scarcely ever absent from the island of St. Thomas. By the last accounts the disease was again prevailing there; and in the *La Plata* steam ship, which arrived at Southampton from that island last week, fifteen fatal cases of yellow fever occurred during the voyage.* Yellow fever and small-pox had been prevalent at Sierra Leone; but late accounts announce their disappearance from that colony.†

At the Gambia, yellow fever had proved fatal to sixteen out of forty European inhabitants; and at Goree several of the French colonists had died from it.

From the report on meteorology and epidemics, by Dr. Wilson Jewell, published in the *Transactions* of the College of Physicians of Philadelphia, in Hays's *American Journal of the Medical Sciences*, No. lxxiv, pp. 403-6, we learn, that at the port of Philadelphia, U.S., a number of vessels from ports in the West Indies, where yellow fever was prevailing at the time of their sailing, were detained in quarantine in the month of July 1858. Several of the vessels had malignant yellow fever on board, and the patients were received into the Lazaretto Hospital, under the care of Dr. Filbert. Twenty-

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* Since the above was written, another of the West India mail packets, the *Tasmania*, has arrived fever-stricken at Southampton. Yellow fever appeared on board the *Tasmania* just before she left St. Thomas, on the 31st of Oct. The voyage was protracted a week beyond the usual time, on account of the vessel having had to run to Bermuda to repair and coal. Thirty-nine cases of yellow fever occurred during the passage, of which twelve proved fatal.

H.M.S. *Gladiator* had also recently been infected with yellow fever while coaling at St. Thomas. The vessel had proceeded as far as Tortola, when fresh cases occurring, she at once made for the northward, and reached Bermuda on the 10th of Nov. with twenty-two cases of yellow fever on board. Captain Hutton, the superintendent of the Royal Naval Yard, by the advice of Dr. Beith, chief medical officer of the Royal Naval Hospital, sent the vessel to Halifax with all possible dispatch.

† Mr. Robert Clarke, colonial surgeon on the Gold Coast, who was, for upwards of eighteen years, a medical officer at Sierra Leone, in his *Sketch of the Manners, Customs, and Diseases of the Natives and Europeans in that Colony*, mentions the concurrence of yellow fever and small-pox during the epidemic at Sierra Leone and the Gambia, in the years 1837 and 1839. Vide Sierra Leone, etc., p. 86.

seven cases were admitted to the hospital, of whom the small proportion of four died.

Dr. Filbert, anxious and exhausted by his duties in the infected ships, as well as at the hospital on shore, was himself attacked with the disease. Fortunately the seizure was of a mild character, and he soon recovered.

Unfortunately, two infected vessels escaped the vigilance of the officers at the Lazaretto, and in some way found their way to the city, where they delivered their cargoes and crews. In a few days several cases of yellow fever appeared among the persons employed about these vessels, and in the vicinity where they lay. It was impossible to ascertain with exactitude the number of cases that did occur; but from the most reliable information, there were probably from thirty to thirty-five. Of these many could be traced to direct communication with vessels from yellow fever ports, and which had not undergone quarantine. As usual, there was a diversity of opinion as to whether the disease was of foreign or domestic origin.

From the recently published report of the committee appointed to investigate the yellow fever epidemic of Charleston in 1858, it appears that the entire number of cases of yellow fever in that city was 1571, of whom 1126 recovered, and 445 died. The committee were of opinion that the disease was of local origin.

Brazil, a country in which yellow fever was unknown for at least a century previous to 1849, still continues to be infected by that disease, which, as usual, attacks and proves specially fatal to strangers arriving at the seaports.

Plague reappeared at Bengazi, in the Regency of Tunis, in the course of the spring, but the attacks were comparatively mild, and the disease has for some time disappeared. A false alarm was raised in the summer, to the effect that this scourge had broken out at Beyrout.

Scarlatina and diphtheria have been epidemic in most parts of the country, more especially in the rural districts, and in some of them have given rise to a very notable increase of the

mortality.* These diseases, according to the report of the Registrar-General, began on the southern coast, and during the year spread over the north midland and the northern counties. Diphtheria, as you are aware, has been a subject of special investigation by a sub-committee of the society.

From the replies to the queries issued by the sub-committee, already sent in, Mr. Radcliffe, the Secretary, has been enabled to draw up a report, which will be laid before the society at an early meeting.

In the *Transactions* of the New York State Medical Society, noticed in Hays's *American Journal*, there is an account, by Sylvester D. Willard, of an epidemic of diphtheria at Albany, U.S., with which there coexisted, among the adult population, a diffuse inflammation of the throat of a mild character. The disease prevailed chiefly among children under twelve years of age. Its onset was sudden and insidious, the deposit in the throat having on many occasions taken place to some extent when attention was first attracted to the case. The deposit extended rapidly over the palate, tonsils, rima glottidis, into the larynx and trachea, producing mechanical obstruction to respiration, the patient dying with all the symptoms of croup.

In the same able journal there is a notice of a paper by Dr. J. Blake, on Diphtheria in California, recorded in the *Transactions* of the Medical Society of California. Dr. Blake states, that, contrary to the generally received opinion that the disease is peculiar to low, damp situations, the most fatal epidemic that had fallen under his observation, occurred at an elevation of about four thousand feet above the sea, though in a village situated in a hollow surrounded by higher hills. It was chiefly,

* The progressively increasing mortality from scarlatina, in some parts of the United States of America, has also of late years been remarkable. In Philadelphia, during the decenniad 1831-40, there were 2004 deaths from this disease; in that from 1841-50 they amounted to 2585; and in the eight years comprehended between 1851-58, they reached as high as 3475. During the twenty-three years preceding 1831, there were in all only one hundred and sixty-two deaths from scarlet fever. Hays's *American Journal*, No. lxxiv, p. 406. Dr. Wilson Jewell's Report.

however, on the Sacramento valleys, and those of the coast range, that the disease had been found most fatal and prevalent.

Diphtheria has also appeared in the Australian colonies, in the early part of the present year. The disease broke out at New Norfolk, in Van Diemen's Land, in January. New Norfolk lies on the banks of the Derwent, on a slightly elevated position. The weather is reported to have been cold and ungenial, with damp and much rain. In New South Wales diphtheria has likewise prevailed to a considerable extent.

The origin and progress of this disease in a country like Australia, must be a most interesting subject of inquiry. Hitherto these colonies have enjoyed a remarkable immunity from endemic and epidemic diseases. It is true that measles and scarlet fever have frequently been introduced by emigrant ships, and have been productive of considerable mortality; but small-pox is a disease still unknown there. From the general absence of marsh miasmata, remittent fevers, until the gold discoveries, were scarcely ever met with. This exemption was supposed to be partly owing to the absence of deciduous foliage in the trees, and the antiseptic character of the vegetable remains when brought into a state of decay. Dr. John Dobie, R.N., whose knowledge of the colony is extensive, considers the salubrity of the climate to be such, that it is altogether unfavourable to the production of endemic disease, and to the propagation of any infectious epidemics that may chance to be imported into the country.* Altogether, Australia must be reckoned as one of the most healthy regions of the world; and its invasion by so destructive a form of epidemic disease as diphtheria, is a subject for inquiry of great interest and importance.

Recent information has reached us of the appearance of

* The late Sir Maurice O'Connell, who was commandant of the forces at Sydney, and who, so far back as 1818, commanded the 73rd regiment, stationed there, pointed out to Dr. Dobie the site of an old encampment of natives, belonging to the Port Jackson tribe, among whom a mild form of small-pox broke out, and carried many of them off. Dr. Dobie was unable to get any further information regarding the outbreak, no record of the occurrence having been fallen in with in the office of the Colonial Secretary.

diphtheria in India among the boys of the Scottish Presbyterian Orphanage, at Bombay.*

Diphtheria, which appeared for the first time at Lima in 1821, and afterwards, to a limited extent, in 1850 and 1855, again broke out there in 1858. The black races, on these occasions, proved as resistant to diphtheria as they were to yellow fever. Dr. Josè J. Bravo prognosticated the invasion of this disease so early as February 1858, on the ground that its course was from north to south, and that it had prevailed epidemically a year and a half previously at Puira, passed to Trujillo, and thence to Huaco, places where it made some victims. (See Hays's *American Journal*, vol. xxiv, p. 521).

In China, the normal diseases of the country—fevers and fluxes—have prevailed to a considerable degree among our naval and military forces. Since the occupation of Canton, the troops have seldom been altogether free from typhoid fever, which is supposed to have been maintained by the bad drainage of the quarters. Dysentery has also been a frequent and fatal form of disease among the soldiers and sailors on that station. This disorder is often complicated with remittent fever, or inflammation of the liver, and if the causes exist in great intensity, as on the marshy banks of the rivers, with both combined.† Bowel affection, in the form of diarrhœa, in which the most frequently found morbid alteration was an extreme attenuation of the tissues throughout the gastro-enteric track, with occasionally ulcerated patches, has also been productive of much mortality. The Sepoy regiments in China suffered much from this kind of bowel disorder.

Cholera. Since the great outbreak of cholera at Jessore, in 1817, no disease of modern times has committed such ravages in those quarters of the globe, where, in the course of its

* A valuable paper on diphtheria, as it appeared in Bengal in 1833, by Dr. Jackson, of H.M. Indian Service, was read at the Meeting of the Society, held Monday, April 4th, 1859.

† It is worthy of notice, that the Chinese carefully avoid drinking water alone, always using the tea infusion to quench thirst, even in the night. They, it is true, suffer from dysentery, but in a much less severe form than Europeans.

epidemic progress, it has for a while settled. Cholera has now been so long regarded as an established endemic of India, that we now hear of its appearance in different localities in that country without surprise, and with comparatively little interest. It is otherwise when this terrible invader approaches nearer home. We then begin to consult maps, and to compare dates and seasons, in order to ascertain how far the disorder, in respect to its period of invasion, its march, and its mortality, coincides in character with that which it exhibited during its former visits to Europe.

Cholera broke out among the troops and seamen after the capture of Canton, but it never advanced to the epidemic form. During the last summer it has prevailed sporadically on various parts of the China station. The same disease appeared in July last at Bombay and Poona, and almost simultaneously on the continent of Europe; selecting on this, as on former occasions, the city of Hamburgh as the scene of its development. It broke out there in the middle of June last, at once attacking, according to Dr. Helbert, "young and old, rich and poor, in all parts of the town; showing no preference to the waterside over any other locality." Altona, and other places in the neighbourhood, were invaded by the disease in the latter part of July. By the end of September the disease had abated at Hamburgh, the number of cases up to this time having been 2130, and of deaths 1148.*

Cholera appeared at Helsingfors, in the Gulf of Finland,

* *The Cholera in Germany.*—Up to the 15th of Sept., there have been altogether, in Hamburgh, 2436 cases of cholera; out of which 1194 died, and 1149 recovered; 93 were still under treatment. In June there were 27 cases; in July, 1025 (89 cases in a single day—viz., the 24th); in August, 1217 (61 on the 16th), and in September, up to the 15th, 135. On the 15th of September, only one new case was recorded. At Lübeck, the cholera made numerous victims from the 26th of July to the 8th of September. Altogether there were recorded 329 cases, and 163 deaths. It is considered that the epidemic has quite disappeared. At Goldberg, in Mecklenburg, there were, in seventeen days, 263 deaths, out of a population of 2700 souls. At Rostock, which numbers 26,000 inhabitants, there were 494 deaths from the 5th of July to the 17th of September.—*Deutsche Klinik et Gaz. de Méd. de Paris. Lancet*, November 12th.

about the middle of July. The disorder, however, abated, after a comparatively cool week, at the end of the month. Forty cases, and thirty deaths, were reported up to the latter period.

The existence of cholera in the southern part of Sweden was announced about the middle of August, when three cases occurred at Malmo, in Scamia. Their origin was ascribed to importation by a vessel from Rostock, where the disease was known to be prevailing. They all proved fatal. On the 5th Sept. the disease declared itself at Stockholm, the capital of the kingdom. By the end of October there had been two hundred and thirty-one cases, of which one hundred and thirty-five had died; but the epidemy by this time was fast disappearing.

While cholera was prevailing at Hamburgh, in lat. 54° N., at Helsingfors, in lat. 60° N., and at Stockholm, also in 60° N., places at no great distance from, and in frequent communication with, each other, the same disease appears to have broken out in a part of the continent remote from those ports, viz., in the province of Murcia, which is situated in lat. 38° N., on the south-eastern, or Mediterranean, coast of Spain. Cholera was reported in the town of Murcia early in August, but by the end of September the disease had nearly ceased. It appears, however, still to linger on that coast, as by a recent *Gazette* Valentia and Alicante are still considered as suspected of cholera infection.

More recently the disease had reached Rotterdam and Bruges. At the latter place cholera made its appearance in the early part of September, and its progress soon became most alarming. On the 5th of October there were forty deaths, or at the rate of two hundred and eighty per week in a population of 50,000; so that having regard to the difference of numbers, this is equal to a mortality in London of 15,000 to 16,000 weekly.

Cholera has been prevailing among the French at Algiers, and it has also invaded the Spanish army in Morocco. Already several superior officers, besides numbers of the soldiers, have fallen victims to this scourge.

Within the last two or three months there have been occasional cases of cholera at Jamaica, the particulars of which Dr. Lawson, the principal medical officer of the army there, promised to forward to the society.

We are not, as yet, in possession of any satisfactory or trustworthy information with reference to the origin of the disease in any of those ports of the continent to which allusion has been made, but we know that in the course of this last summer cholera was imported into several of the ports of this country from Hamburgh. The disease was brought into the Thames, on the 30th of July, by the *Cosmopolitan*, screw steamer, from Hamburgh.* This vessel lost two stokers from cholera during her passage of forty-eight hours, and she sent, in all, three cases to the *Dreadnought* hospital ship, of whom one died as the boat got alongside, and another some days afterwards. Another case, which also proved fatal, occurred on board the *Moselle* steamer while she was in the river, on the 28th of August. The patient, a married lady, had been for some weeks residing at Rostock, where she lost at least one member of her family from cholera.

Besides these cases from Hamburgh, two stokers, affected with cholera, were sent to the *Dreadnought* from the *Pomona* steamship from Cronstadt and Copenhagen, on the 17th of September. Both of these cases died; one two hours after admission, and the other on the following day.† The *Pomona*, after delivering a consignment of machinery to the Russian Government, left Cronstadt on the 7th of September. On the 12th she reached Copenhagen, where she was detained "coaling" fourteen hours. On the 14th, a boy, who had been picked up in a destitute condition at Cronstadt, was taken with the usual symptoms of cholera, and died in fifteen hours.

* A case of cholera was received on board the *Dreadnought*, on the 28th of July—two days before the arrival of the *Cosmopolitan*—from the *Eugenie*, a vessel in the Commercial Docks, which arrived there on the 20th of the same month, from Pensacola, in the Gulf of Florida. The case proved fatal.

† There were some doubts as to the real choleraic nature of these cases in the *Dreadnought*, but their history, in conjunction with that of a boy who died on board the *Pomona*, leaves no doubt that both were cholera cases.

The two stokers were attacked with similar symptoms shortly afterwards, and, as already stated, were transferred to the *Dreadnought* on the arrival of the vessel in the Thames.

At the infirmary of Hull, a sailor, labouring under cholera, was received as a patient, on the 8th of August, from the *Archimedes* steamer of Hamburgh.

The Spanish steam ship *Cabana*, reached Grimsby, from Hamburgh, on the 16th of August. The same evening two cases of cholera occurred on board, but they both recovered. The *Cabana* had sent one stoker to the hospital, while at Hamburgh, on account of cholera.

At Southampton there was a fatal case of cholera on board the *Saxonia*, emigrant steamer, from Hamburgh, on the 25th of September. Two cases of choleraic diarrhœa followed on the next day, but they were soon segregated from the rest of the passengers, and the disease did not extend.*

In none of the cases just related was there any evidence of the disease having been communicated to this country, although in all of them there was more or less intercourse between the ships and the shore. The following, for the details of which our Secretary is indebted to Dr. Emmerson, of North Shields, is, however, an instance in which the main conditions considered necessary to prove contagious propagation, appear to have been present.

A sailor boy was received into a lodging house at North Shields, from a Hamburgh steamer, on the 12th of August last. He had been ill for some days with choleraic symptoms, and he died of undoubted cholera in four days after being landed. On the day before the death of the sailor, a fine boy, about three years of age, living in the same house, and who had often been in the sick room of the sailor, was seized with the usual symptoms of cholera, and died on the following day. On the succeeding day (the 17th of August) a young German girl, the maidservant, who had most devotedly nursed her

* In the last week of July, several of the coast guard officers on the banks of the Itchen, were seized with choleraic symptoms. In the early part of August, one of these men was taken with cramps, and died in nine hours.

countryman the sailor, and the child, was also taken with cholera, which carried her off in eight hours. It is right to mention that six seamen, recovering from ague, a wounded sailor, and several domestics in the house, escaped; nor did any of the numerous visitors to the house suffer. Still, on the assumption that there was no cholera in Shields before the arrival of this Hamburgh vessel, the cases in question appear to afford positive evidence of communication by contagion, which cannot be controverted by any number of negative results.

From the time that the existence of cholera on the continent was known, our government appear to have been fully alive to the necessity of taking measures against the invasion of this country by that scourge. Quarantine restrictions were not resorted to, nor was the freedom of commerce, or of intercourse with other countries, at all interfered with; but every precaution short of these was taken by the authorities. All arrivals from the continent in the ports of this country, more especially in those having intercourse with Hamburgh, were carefully watched for cholera cases; and in those vessels where the disease was found to exist, a certain degree of isolation from other ships, and limitation of intercourse with the shore, were recommended, and as the adoption of these suggestions was attended but with very slight inconvenience, they were in all cases readily carried out. The sick sailors brought into the Thames were at once transferred to the *Dreadnought* hospital ship, and had occasion required, cholera hospital ships were ready for immediate use. The local authorities at the outports were exhorted to provide places of reception for poor passengers and seamen who might arrive suffering from cholera. They were also furnished with the admirable provisional memorandum, drawn up by Mr. Simon, which earnestly urges upon local authorities the immediate and energetic exercise of the powers conferred on them by the Nuisances Removal Act, during the prevalence of cholera, diarrhœa, diphtheria, typhus, or any other kind of fever; and which also contains concise and clear suggestions for the prevention of these and other epidemic disorders.

Cholera in this country. Diarrhœa was unusually fatal in London during the past summer, and a death from cholera was occasionally to be found in the reports of the Registrar-General. Partial outbreaks of cholera, as on the banks of the Itchen, near Southampton, are said to have occurred in some of the country districts; but except at Wick, in Caithness, and at Glass Houghton, in the parish of Castleford, near Pontefract, the disease appears nowhere to have assumed an epidemic form.

Wick, a fishing town, and the port of Caithness, the northernmost county of our island, was invaded by cholera on the 8th of September. Dr. Sinclair, of Wick, reports, that up to the 17th of October there had been one hundred and seventeen cases of diarrhœa, and of cholera thirty-seven cases, of which nineteen had proved fatal. By the last account, which is dated October the 23rd, the disease was on the increase, and the consequent panic among the people was great. Dr. Sinclair attributes the origin of the disorder to the introduction of old clothes, but he has not yet stated whence the clothes in question were imported. By the latest information the disease was subsiding at Wick; and the Board of Supervision at Edinburgh had sent Dr. Littlejohn to examine into the sanitary condition of the town and neighbourhood, and to see the immediate carrying out of an order in council, placing Wick under the provisions of the Nuisances Removal Act.

Dr. Ellison, another practitioner of Wick, considers that Dr. Sinclair overrates the number of cases, and declares his total inability to trace the disease to introduction from without.*

Glass Houghton, as described by Dr. Simpson, the health officer of the district, stands on the slope of the limestone, and is, as a general rule, badly drained. Cholera broke out at the eastern end of the town on the 4th of October, when there occurred two deaths. On the 5th there were four deaths; on

* A communication subsequently received from Dr. Banks, Parochial Medical Officer at Wick, states, that there was no ascertained foundation for the importation theory.

the 8th, one; on the 9th, two; and on the 10th and 14th respectively, one. Another case, which proved fatal, from consecutive fever, raises the number of deaths to twelve, in a portion of the village, the population of which was about sixty persons, the number of persons attacked having been nearly thirty.

Dr. Simpson ascribes the outbreak to the use of water from a well polluted with fæcal and other noxious matter.

Small-pox. Allusion was made last year to the prevalence of small-pox at the Cape of Good Hope, and in the subsequent history of the epidemic there is a proof of the pertinacity with which that disease, once introduced, clings to a population of which the coloured race forms a constituent part. The disease still rages fatally in the eastern provinces of the colony, at Graham's Town and Port Elizabeth; and more recently it has appeared at Cradock, Bedford, Farmerfield, Fort Beaufort, King William's Town, Fort Peddie, Alice, Somerset, Graaf-Reinet, Hope Town, and other places. Intercourse with infected districts was avoided, and the consequent effect upon trade among them was severely felt.

Small-pox in China. Some cases of small-pox broke out in the soldiers' quarters, and in the ships at Canton, in the first three months subsequent to our occupation of that city, but it never assumed an epidemic form. As the Chinese propagate small-pox by inoculation, the disease is always, to some extent, existing among them, and appears to become epidemic in the spring of each year. No stronger proof of the beneficial influence of vaccination can be adduced than that furnished by the men of the army and fleet in that country, who, although everywhere exposed in masses to foci of variolous contagion, from their free and unrestricted intercourse with the Chinese, nevertheless suffered but little from that loathsome malady.

In the spring months of the present year small-pox appeared among the troops, seamen, and marines, at Canton and Hong Kong; and in autumn the squadron to the northward was affected by the same disease. The cases were numerous, but, as a general rule, of a mild character, seldom proving fatal.

It seems but fair to conclude that the very small loss from small-pox by our forces in China, was in a great degree owing to the complete vaccination of the men, revaccination being performed upon all sailors and soldiers in whom the proof of infantile vaccination is unsatisfactory.

An epidemic ophthalmia, in the form of catarrhal conjunctivitis, appeared among our military and naval forces at Macao and Canton early in June; at Hong Kong somewhat later; and afterwards it passed northward to Shanghai. On some occasions, ships coming northward from the southern part of the station appeared, all at once, to enter an ophthalmic zone, so that half of the crew would be affected with the disease in a single night. The affection was, however, readily amenable to treatment, seldom lasting beyond three or four days.

Most of you are aware that the Society presented a petition to parliament in favour of a *permanent* Public Health Act, which was happily carried during the last session. Among other important objects thus gained, the act places the public vaccination of England and Wales under medical supervision. This is a point for which the Council of this Society have constantly striven from the time of the presentation of their memorial to Government in 1855, feeling assured, as they therein expressed themselves, that it was the keystone of an effective system of vaccination. The act alluded to imposes on the Privy Council the duty of issuing regulations for securing the qualification of public vaccinators, and the efficient performance of vaccination; and also of inquiring into the manner in which these regulations are carried into effect. Such duties will of course be discharged by the Privy Council under the advice of their medical officer, our distinguished colleague, Mr. Simon. The regulations now anxiously looked for, and soon to be issued, will, doubtless, enable this country to realize to a far greater extent than it has yet done, the benefits conferred by the magnificent discovery of Jenner.*

* Since this Address was delivered, the regulations in question have been issued by the Lords of the Council, and they appear to be admirably calculated to attain the important object at which they aim, viz., the securing the proper

For its sins of omission in this respect, England is at this moment suffering under the scourge; and the great epidemic of small-pox, which commenced in 1857, and to which allusion was made last year as so prevalent at that time in some portions of the kingdom, has for the last twelve months had possession of this metropolis, within the limits of which, scarcely less than one thousand persons have paid, in this period, by death, and probably ten times that amount by sickness, the penalty of their neglect of, or of the imperfect manner in which they have received, the great prophylactic of vaccination.

The Society has now been engaged for nearly ten years on the great questions connected with epidemiology. Valuable papers have been read at the meetings, and instructive and interesting discussions have been raised. It is, moreover, satisfactory that the labours of our Committees have, on some occasions, been made available by the legislature; but to be in any considerable degree instrumental in procuring so great a national boon as the universal and efficient vaccination of the people, would be a great achievement, and one upon which we may one day hope to congratulate the Society.

At the recent annual meeting of the National Association for the promotion of Social Science, numerous papers were read, in the department of public health, on subjects altogether akin to those which form the more special objects of our investigations. An admirable paper, "On the Physical Effects of Diminished Labour in Factories," was read by Mr. Baker, who, after many years of unceasing toil in this philanthropic work, while practising as a surgeon in Leeds, has recently been appointed one of the Government Inspectors. The disappearance of scrofulous and rachitic disease among the young operatives, and the general healthy condition of all employed, since the regulation of the hours of labour, and of the age of the children engaged, with the simultaneous improved ventilation and

qualification, in respect to vaccination, of persons hereafter to be appointed public vaccinators, and the more efficient performance of vaccination by present or future vaccinators.

comfort of the mills, form a striking instance of what may be done in the prevention of sickness, suffering, and premature death, by judicious hygiene. To Lord Shaftesbury, more than to any other man, this great work is mainly due.

Two papers on the sanitary condition of Bradford, shewed, among other points, the diminution of the death rate, of recent years, since greater attention has been paid to the cleansing of the town, the supervision of common lodging houses, and other matters of sanitary police.

Mr. Rumsey, of Gloucester, communicated an able paper, pointing out the deficiencies in our public records of mortality and disease, with suggestions for an improved national system of registration.

On the subject of quarantine, which has on more than one occasion engaged our attention, two papers were read by Dr. Milroy—the one being a preliminary report from the committee which was appointed by the National Association at Liverpool last year, and of which most of the medical members are also members of this society—and the other, an account of the International Quarantine Conference held at Paris in 1851, the results of which have hitherto not been made public. It may be hoped that the thorough inquiry which has been set on foot by the association, and which already has had the effect of eliciting a large amount of valuable information from different parts of the world, will serve to enlighten the profession, and the public generally, on this important subject, and may thus lead to some useful changes in the system hitherto pursued.

Gentlemen, I have thus performed a pleasing duty in reading you the able *resumé* drawn up by my friend on the right, who I may emphatically call "my right hand man;" and it only remains for me to entreat you, stimulated by his good example, to show zeal in the good cause we have taken up, by furnishing us with appropriate papers, and by punctually attending during the session our monthly meetings.

ON THE THEORY OF ZYMOSIS.

BY BENJAMIN W. RICHARDSON, M.A., M.D.

Read on Monday, November 7th, 1859.

THE subject I have to bring before the Society to-night bears not on one epidemic disease, but on the whole group of epidemics. If that which I have to propound be true, I may add to the above statement: I may say that the subject to be brought forward bears on diseases which as yet have not been considered as within the cognizance of the epidemiologist, and that it presents this apparent paradox: it extends the verbal list of epidemic disorders, whilst it reduces the disorders actually to a few unities.

In this opening page, it is fair to the Society to allow at once that much that has to be stated is and belongs to theoretical argument. The title of my paper—Zymosis—refers to a theory, nothing but a theory. I am not going to combat this theory altogether, nor support it altogether, but I shall aim to give to it a reading which is new, argumentative, and abstract; a reading which is in my opinion entirely accordant with known facts, and which brings into coalescence much that was before conflicting and opposing.

Let me, in the first place, state the views that have been promulgated by various authors regarding zymosis or ferment, as an external phenomenon. Philosophical speculation on the process of fermentation is very ancient, and the term has at all times claimed for itself a distinctiveness which is remarkable, inasmuch as the process it denotes is and has ever been obscure, has received no explanation other than that which is hypothetical, and has received almost as many explanations as it has claimed expositors.

The whole of the hypotheses which have thus been broached resolve themselves, however, into three great divisions—viz., the *vital or organic,* the *physical,* and the *chemical.* The oldest of these, the *vital,* compares the fermentative process to the process of reproduction, as observed in animals and plants. The second or *physical* hypothesis assumes the existence of two contending forces; the one of attraction and cohesion, peculiar to the molecules of all bodies,—the other of rarefaction, resi-

dent in the air under the influence of heat. By the latter force exerted or manifested on the molecules of matter, these are supposed to be separated and resolved into new forms, the intestine motion instituted being fermentation. This hypothesis, first broached by a man now almost forgotten in literature (Dr. Morgan), claimed to explain zymosis on Newtonian principles, and was as popular in its day as any advanced in our own.

The third, or *chemical* hypothesis, has been expressed at various times by different formulæ, and has retained a position in science since the time when organic chemistry received its first touches from the hands of Paracelsus and Bremer. The general explanation given of the process has been pretty uniform and never essentially different, except in detail, from the latest definition; I mean that advanced by Liebig, which assumes that as fermentation is always excited when, under favourable external conditions, decomposing albuminous substances are brought into contact with ternary compounds such as sugar, so the process itself is due to a communication of the molecular disturbing force, resident in the albuminous substances, to the ternary body, the end being a resolution of the complex body into simpler and more stable products.

Such have been the general views on fermentation as a simple and observed phenomenon. They would interest us but little in this place, had it not been that the hypothesis of a ferment, or, as it was first termed by Dr. Farr, of zymosis, had relation to certain views entertained now and for a long period past, on the origin of the spreading or epidemic diseases. More than fifty years ago Dr. Parr, in noticing this supposed origin of diseases in a ferment, spoke of such origin as based on a "loose analogy." Were he writing now, he might repeat the assertion.

In discussing zymosis in the human body, those who have entered on the debate have made little attempt to consider it under the different aspects noted above. Those who have advocated the analogy have accepted the vital hypothesis of the fermentation process. Those who have been in opposition have opposed the zymosis idea altogether. I will briefly sketch out the opposing arguments.

The view commonly held in regard to the nature of the zymotic diseases, is that these diseases depend for their development and manifestation on what have been called "vital germs"; in other words, on bodies of organic character, unknown altogether to the senses, but recognisable hypothetically by their effects.

This view is supported by many common phenomena. These phenomena may be ranged as follows:—

1. That the virus of diseases of the zymotic class has a reproductive property or power, the conditions favourable to such reproduction being supplied.

2. That the conditions necessary to the reproduction of the poisons of the zymotici are similar to the conditions necessary for the development of many, if not all, organic bodies.

3. That, as a general rule, the development of a zymotic disease in an animal prevents the redevelopment of the same disease in the same animal. Here again an analogy has been instituted as between the development of the "vital germ" of disease in the subject and the development of vegetable growths, in a soil favourable to their growth, for one season alone.

Of these phenomena considered individually, the first is the one on which most stress has been laid by the advocates of zymosis, not as a verbal but as a real process; I mean the phenomenon of reproduction, as manifested in disease-producing poisons.

Mr. Grove, who is well known in this Society as the defender of the "vital germ" hypothesis, thus embodies his own thoughts and those of many writers who have gone before:—"We may fairly infer that, if a quantity of matter inappreciable in amount be sufficient to exhibit the characters of growth and increase, it is endowed with the properties of vitality. That the poisons of scarlet fever, small-pox, and of measles, have this power of growth and increase, is as much a matter of universal belief as that 'the sun will rise and set to-morrow,' and that 'all living beings will die.'

"This power of individual increase or reproduction is the very summit of vital manifestation; indeed Coleridge, in his 'Theory of Life', (in which he says—'I define life as the principle of individuation, or the power which unites a given all into a whole that is presupposed by all its parts',) places reproduction in the first rank, and expresses his hypothesis thus:—'The constituent forces of life in the human living body are, 1st, the power of length or reproduction; 2nd, the power of surface or irritability; 3rd, the power of depth or sensibility. Life itself is neither of these separately, but the copula of all three.'

"Extensive research is not required to shew that many thinking men believe in the existence of living organic beings as the elements of contagious and epidemic diseases; the idea indeed seems to flow spontaneously in that direction. When-

ever thought and enduring contemplation have been concentrated on the subject the result appears to have been the same—a firm conviction in each individual mind that a vital force must have been in operation, or, as Schlegel would define it, 'a living reproductive power capable of and designed to develope and propagate itself.'"

In concluding his first chapter, Mr. Grove adds, with much force, the following remark:—"It has never been found that men have 'gathered grapes of thorns or figs of thistles,' nor has it ever been discovered that inanimate matter multiplies itself. The seed of disease is 'within itself,' multiplying and propagating itself; whether it formed a part of creation at the beginning or not, is rather a question to be solved by divines than physicians. When we know, however, the latency of seeds,* and even of entire plants, and that they may be dried and remain so for years, yet being brought again into conditions adapted to their active existence, they, as it were, revive from their sleep and renew again their reproductive properties, can we wonder if, in the great scheme of nature, existences new to mankind should make their appearance? When the New Zealander saw the surface of his ground producing to him unknown plants, and the skins of his children generating peculiar eruptions, and each propagating its kind, would he look, think you, to the wood, or the stones, the air, or the water, for the solution of the mystery? No. He would naturally say, 'These people brought the seeds with them.' From the property of reproduction possessed by these forms of matter, we infer the value of the proposition."

In contradiction to the views expounded above, it has been argued by many observers that the theory of zymosis, or ferment, is opposed altogether to experimental fact and deduction. By the representatives of this side it has been urged, that as yet no evidence whatsoever has been adduced to indicate the actual presence of a cell or other mark of organic growth in the poisons of disease, as in the virus of small-pox, the bowel excreta of cholera, or the desquamation of scarlet fever. True, an attempt was made a few years since to shew that the virus of small-pox contains spores and cells resembling almost identically the spores and cells of the vinegar plant; but the appearances require confirmation; and granting even the existence of such spores and cells, the question of the necessity of their presence in fermentation would remain a negative,

* Seeds taken from Theban mummies, three thousand years old, have germinated at the present day.

since fermentation may be excited, as Mr. Henry long ago pointed out, by an artificial yeast made of gluten, through which carbonic acid gas had been diffused, and as it has since been shown as occurring from any decomposing nitrogenous body, independently of such gaseous admixture. When, therefore, sporules and cells are found in a fermenting mixture exposed to the air, whether that be yeast, the vinegar thallus, or the virus of small-pox, the inference is, not that they are the product of fermentation, but that they are externally derived, and find in the fermenting matter a habitat favourable to their development and increase.

It may be further insisted on, that, if the zymotic diseases were truly manifested by the free development of the so-called "vital germ", such development would continue in every affected body so long as the body could supply, through respiration and digestion, the means of nourishment for the new growth; and that, as a result, every case of disease so induced, would be fatal in its natural course, which is just contrary to the fact. Lastly, it has been said, that the epidemic diseases are often closely imitated, in their action on the body, by various inorganic poisons. Thus scarlet fever is imitated in the symptoms produced by the alkaloid atropine; small-pox in the symptoms of pustule caused by antimony in some particular instances; and typhus and yellow fevers in the signs and pathology caused by the free administration of the alkalies.

In analyzing the arguments here involved, we are struck with the force advanced on both sides. Each side argues from analogies, and on each side the analogies are fair and reasonable; and although, as Campbell has well observed, "analogical evidence is but a feeble support, is seldom honoured with the name of proof, and is the defensive rather than the offensive weapon of the writer", we are bound to accept it in this argument as the only weapon of defence and offence.

The view I would present on the present occasion, as explaining the difficulties which beset both these arguments, is, that in the propagation of all the communicable diseases, there is a step in the process which consists in the development of an albuminous matter having the power of exciting chemical changes, or zymosis in the organism; and that there is a second process, consisting of a modification in the animal chemistry, in the formation, that is to say, of new and inorganic poisons, upon the presence of which the symptoms of the disease depend.

It will perhaps be the best means of illustrating the propo-

sition noted above, to refer to one or two examples of disease from poisons of animal origin.

The cobra di capello secretes constantly a poison, and an organic poison. It is not to be assumed that such poison is in the blood of that animal in the form of poison; it is to be supposed that the poison is made in the act of its secretion; that it has, in other words, a local origin.

When the cobra di capello bites a man, and death ensues in an hour or less, the man dies because an animal and organic poison is introduced into his circulation. It is not, however, to be assumed that this man dies because the poison in that short period is multiplied or reproduced in the body of the victim. It is to be assumed, rather, that the man dies because the introduction of the poison sets up a series of new chemical changes, and a series of simple but poisonous chemical inorganic compounds. This view is supported both by symptom and pathology. In the illustration offered above, we have, moreover, evidence of the nature of the poison which has been generated in the affected body. In the bodies of persons inspected after death from this cause, the blood has been found unusually alkaline, and the alkali present in excess has been found to possess the physical property of volatility. The presence of an agent of this nature accounts fully for the symptoms during life, and for the appearances after death; for I have found that the volatile alkali may be administered in such proportions as to destroy life, and to produce the symptoms and *post mortem* results described as occurring from the poison of the cobra.

The observations thus made in regard to the poison above named, extend directly to at least one disease—I refer to yellow fever. Dr. Blair, in his history of the yellow fever, as observed by him, notices with special care the condition of the blood after death. The blood, he says, was so fluid that it resembled port-wine in consistency, and from it ammonia was evolved so freely, that the nose test was all sufficient to prove the presence of the volatile alkali. The symptoms here again correspond with the effect produced by the slow administration of alkalies by the mouth. Nay, so far do the symptoms agree, that the yellowness of the tissues comes in as a direct parallel. In animals subjected by me to the alkalies, in constantly repeated doses, the conjunctivæ assumed a yellow tinge, and the serum effused into the serous cavities exhibited the same peculiar and characteristic appearance.

Without asserting a dogma, it is therefore fair to state, judging from experimental fact, that the poison of the cobra

and the poison of yellow fever, though organic originally, and derived from animal bodies, and communicable from one animal body to another, and not communicable in any other way, do not therefore produce their fatal effects by a continuance of the organic force, but by exciting, by their presence in the previously healthy body, a new series of changes which are purely chemical, and which, being incompatible with the natural chemistry of the economy, lead to dissolution.

We may extend the view here advanced to the consideration of other and more common diseases. In small-pox, as a familiar example, there is a peculiar virus thrown out on the mucous and cutaneous surfaces. This virus is capable of propagating the disease; and it is known to have the effect of including a class of symptoms and a pathology which are specially characteristic. These striking facts have led, and I am candid enough to say have naturally led, many observers to the conclusion that the poison of small-pox, introduced into the healthy body, goes on, by a zymosis or ferment, increasing in the body until it is ultimately eliminated in the form of pustule on the excretory surfaces.

If this supposition, which is, in fact, the basis of the "vital germ" doctrine, could be proved, the whole hypothesis would necessarily be also proved. But is there proof of any kind from which such influence is directly derivable? For my part, I know of none. On the contrary, I think that the evidence of analogy goes to show that when the poison of small-pox has entered the system, it does not propagate absolutely in the system, but that, setting up a new series of chemical results, the blood is so modified that, brought to an excretory surface, the normal secretion is simply prevented, and a new special albuminous excrete is the result.

The same law which governs the special actions of special inorganic poisons obtains, in short, in reference to poisons which are called organic; the same poison produces, *cæteris paribus*, the same consequences. If prussic acid, strychnia, or mercury, be taken by a hundred persons, in the same way, they will produce a hundred times the same results. If small-pox poison be taken by such number of susceptible persons, the results in each, modified only in degree, will be the same. But neither in one example nor the other is it necessary to suppose that the poison is vital; that it reproduces itself in the organism by vital growth, like a seed; or that the agent first introduced is the persisting and persistent cause of all the consequences.

I have chosen small-pox as an illustration of a disease

which, of all others, has been cited as of vital zymotic origin. I need not multiply illustration in this direction.

The ultimate question remains, Is there such a process as zymosis, or ferment, in the animal body? To this I answer with a distinct affirmative; but the views I would offer in respect to such process are—1. That the zymosis, whether occurring in the body or out of it, though manifested always by the agency of organic matter, is essentially a chemical process, leading to the resolution of complex organic compounds into simpler compounds. 2. That when the process occurs in the body, the new chemical products are the causes of the symptoms as well as of the pathology of the diseases excited. 3. That the virus of these diseases is purely incidental to a modified chemistry in the organism; is excrementitious; and is as necessarily an excrete under the modified conditions, as urea is necessarily an excrete in perfect health. That this excrete, as an albuminous product, possesses the power of exciting the zymosis in a person liable to such action, and is connected with symptoms, not by an immediate organic increase of its own parts, but by the establishment of a new series of chemical changes.

I observed, at the opening of this paper, that if the view of zymosis which would be offered were tenable, it would explain many points which otherwise are all confusion; would link certain diseases to the zymotic which are not at this time ranged in that list; and would yet, at the same time, reduce the verbal list to a few units. I must crave the favour of the Society for a few moments to dwell somewhat at length on these points.

For example, this view explains why diseases which are directly communicable from person to person resemble other spreading diseases which are not communicable. The poisons of pythogenic fever and of dissecting-room diarrhœa are not communicable poisons in the strict sense of the word. Yet they give origin to particular cases of disease which may be considered endemic, and by extension of cause, epidemic.

A second explanation supplied by this theory relates to the quantity of poison required for the production of symptoms. It has often been a subject of wonder why so minute a portion of the virus of a disease, such as small-pox, excites such decided effects. Dr. Fordyce largely diluted the virus of the above-named disease, hoping thereby to induce a milder form of the disorder by inoculation. He was mistaken in his hopes; for he found that the disease, if produced at all, was as severe after extreme dilution of the virus as when the virus was directly used.

The reason for this is sufficiently simple when we recall that, in zymosis out of the body, the external conditions and supply of matter susceptible of zymotic change being supplied, the quantity of ferment neither removes the fact of fermentation nor modifies the process.

But more; the theory I have supposed regarding the production of the disease-producing poisons, suggests an alliance between diseases arising from the absorption of an external poison and diseases which are produced by changes taking place in the body independently of any external agency which could be designated as of poisonous nature. In this sense, acute rheumatism is a disease connected in a degree with what are called the zymotici. This disease, in all its symptomatic phases, is due to the presence of a poison in the blood. We now, indeed, know the nature of this poison; we have an idea of the part of the system in which it is produced; and we are conversant of the mode by which it is eliminated. Now, if acute rheumatism could be excited by the inoculation into a healthy body of a virus which would start the formation in the blood of the acid poison on which the fibrous inflammation depends, then rheumatism would be palpably a zymotic disease. As the disease cannot be so produced directly, it has not been considered a zymotic, notwithstanding that its cause is a poison generated in the animal laboratory, and that it is itself one of the purest representatives of the zymotic class.

There is another disease to which I have before referred in this Society as belonging to the zymotici. I mean tetanus. In this disease the poison, in my opinion, is first developed in the wound as a result of decomposition. Thence carried into the circulation, the new substance, without any necessary increase of its own parts, excites a zymosis, ending in the production of an alkaloidal or alkaline body which has all the power of exciting the symptoms of spasm—as much the power as strychnine itself. Nay, in regard to this tetanic poison, we have, as I have pointed out in a previous paper, a clue to the nature of the poison. I showed then that all the specific tetanic symptoms could be induced by the introduction into the body of certain of that series of the ammonias into which carbon enters as a constituent element.

In the next place, the theory propounded explains the reason for the fact why the majority of the epidemic diseases are not fatal, if the patients in whom they occur are placed in favourable conditions for recovery. We have seen that, if the hypothesis of the constant reproduction of an organic poison in the body, and of the presence of this poison as the cause of the

symptoms, were tenable, the process of reproduction of the poison should continue so long as the patient could supply the means for the continuance of the process, that is to say, until death itself. When, however, we take the chemical view of the question, when we consider that the organic virus primarily introduced is not immediately propagated, but induces chemical changes upon which the symptoms of the disease depend, we see a reason why the epidemics run a limited course; since chemical changes, having no independent continuance when their causes are removed, necessarily cease after a time, together with the symptoms which have been excited by them during the period they were in operation.

Another, and most important consideration implied in the above theory, is, that it leads to the direct means by which the zymotici may be studied and experimentally defined. So long as we continue in our researches to hold the opinion that in inquiries as to the pathology of the epidemics we are bound to seek out bodies of a vital form, which are invisible even to the eye of a microscopist, we are labouring after the improbable, if not the impossible. On the other hand, if we study those chemical changes which admit of direct experimental observation, and endeavour, by synthetical processes, to produce in the inferior animals the diseases we have to meet, we are going straightway to the causes of symptoms, and are learning, not only the causes of the symptoms, but the direct means by which these symptoms can be successfully combated.

Working myself in this way, I have been able to show that various groups of symptoms, constituting special diseases, may be excited by chemical agents, the properties of which we understand. Thus I have shown that low fever may be produced by an alkaline body, and all the acute symptoms of rheumatism by the introduction of a well known acid—the lactic. In the same direction, an immense number of experiments might be instituted in reference to other diseases, such as small-pox, scarlet fever, glanders, and hydrophobia. Even the empirical statement, that atropine produces the symptoms of scarlet fever, deserves consideration at our hands, and the test of further experiment. Tetanus is a disease directly open to our experimental skill. Do the secretions of tetanic patients convey tetanic poison? If the exuded matter from a wound in a tetanic patient were inserted into the skin of an animal by inoculation, would it produce tetanus?

By this line of study, I repeat, the verbal list of the zymo-

tici would be extended, but in such very extension there would be a grouping together of principles, which would throw open to our direct knowledge all that could be required to be known regarding this class of diseases.

If there is any truth in the theory of zymosis in the body, its principles or laws are at hand, and are limited. All the primary products of fermentation reduce themselves into two groups, the acid and the alkaline, or the alkaloidal. Experiment demonstrates an analogy, as existent between the action on the body, of certain poisons which would result from zymosis externally produced, and the symptoms of some zymotic diseases developed spontaneously, in the which these very same products are generated.

I must now leave with you, my learned colleagues, these thoughts: your kindly criticism will guide my enthusiasm, whilst your ever ready advice and suggestion will support me for future labours in the great work of inquiry so faintly foreshadowed.

REPORT OF THE DIPHTHERIA COMMITTEE.

(Read before the General Meeting of the Society, Dec. 5th, 1859.)

Committee appointed, January 1859. *Members.*—DR. BABINGTON, F.R.S., DR. MCWILLIAM, C.B., F.R.S., DR. MILROY, DR. JAMES BIRD, DR. SEATON, DR. CAMPS, DR. MURCHISON, MR. ERNEST HART: MR. J. N. RADCLIFFE, *Secretary.*

IN pursuance of the duties assigned to the Committee, to collect information and report upon the epidemic of *diphtheria*, which has prevailed in England since the commencement of 1857, a circular was issued, in February 1859, to the members of the Society throughout the kingdom, requesting their aid. Through the medium of the circular, and by its publication in several of the medical journals, the assistance of the profession generally was also sought; and in order to secure uniformity of character in any reports with which the Committee might be favoured, the following suggestions were made:—

1. It is requisite that the term *diphtheria* should have attached to it one and the same signification by different reporters. Diphtheria is a synonyme of the word *diphtherite*, which was originally adopted by Bretonneau to designate a peculiar form of disease affecting the mucous membrane or the skin, and which is characterised by the formation of a false membrane. Among other examples of diphtheric affection Bretonneau included *cancrum oris*, *croup*, and *inflammation of the throat accompanied with the formation of a false membrane*; but in this country the use of the term diphtheria has been restricted to the last affection, the chief characters of which are described by Dr. Copland in the following words:—"The tonsils, the velum palati, the pharynx, either successively or at the same time, present irregular patches of a yellowish, buff or greyish-coloured exudation on the inflamed surface. These patches enlarge, coalesce, and extend to the nasal fossæ, or to the larynx, with the usual symptoms of primary *croup*, and often also to the œsophagus. In adults, the disease often commences in the nasal fossæ, and extends to the pharynx." (*Dict. of Practical Medicine*—Art. *Throat.*) The committee suggest that, unless the peculiar pseudo-membranous formation be present, the term *diphtheria* should not be used; for if this

restriction be not adopted the term will be deprived of all precision, and it will be impracticable either to collate reports from different districts, or to determine the relation of the disease to other forms of throat affection.

2. The Committee, also, would suggest that the attention of medical men should be directed to the existing state of throat affections in those districts where *diphtheria* has not yet appeared. It is most important, in endeavouring to elucidate the etiology of an epidemic disease, to watch the progress and character of cognate affections in districts where the epidemic has not become manifest, and to be on the look out for the first traces of it. Often the earliest (and scientifically, perhaps, the most important) manifestations of epidemic disease are lost sight of from the want of this anticipatory observation.

3. The Committee, further, suggest that the following questions should be made the foundation of any report with which they may be favoured, and that they should be dealt with in the order given.

1. State the date of the first case of diphtheria which came under your observation, or, if practicable, the date of the first case which occurred in your district.

2. Has diphtheria ever prevailed in the district, within your knowledge, previous to the present epidemic?

3. What was the prevailing character of the throat affections which occurred contemporaneously with diphtheria, or, that disease being absent, what has been the character of the throat affections which have come under your observation recently; have those affections prevailed to a greater or less extent than in previous years, and have any of them been contagious?

4. State what facts you have observed, and what conclusions you have formed respecting the *contagiousness* or *non-contagiousness* of the disease; and if the disease be contagious, what, according to your observation, is its period of incubation or the interval of time between the exposure to contagion and the appearance of symptoms?

5. State what facts you have observed respecting the occurrence of diphtheria in connection with *scarlet fever*.

Note—Whether any patient with diphtheria has ever had a previous attack of scarlet fever, or ever been in communication with any one suffering from that disease, and whether those members of the same family who escaped diphtheria, have, or have not had scarlet fever; also, whether you have ever observed the coexistence of any cutaneous eruption with diphtheria, and if so, of what description has the eruption been, and at what period of the disease did it occur.

6. What were the sanitary conditions of the dwellings in which diphtheria occurred?

7. Have any particular classes of persons, or those engaged in any particular occupations, been more affected by the disease than others?

8. Give what meteorological data you possess bearing upon the development and progress of the disease.

9. Describe briefly the locality in which you have observed the disease, in respect to altitude above the sea, configuration of surface, geological formation, proximity to the coast or large rivers, cultivation and drainage, and the general character and principal occupations of the inhabitants.

10. What were the ages, and what the sex of those you have visited in the disease, and what age do you consider most liable to it?

11. What were the symptoms which you observed on the invasion of the disease, in its course, and towards its termination? State also its duration?

12. Was the urine examined chemically or microscopically at any period of the disease, if so, at what period or periods, and with what results?

13. Was the false membrane examined microscopically and its appearances compared with those of the exudations or secretions accompanying other forms of throat affection prevailing at the same period, and with what result?

14. What has proved in your practice the most successful treatment in the different stages of the disease, and if tracheotomy has been performed in any case, state the result?

15. What was the proportion of deaths to recoveries, and what were the time and mode of death in each case?

16. Describe what you have found on post-mortem examination, (1) as regards the parts which are the seat of diphtheric disease—the pharynx, the trachea, the larynx, etc.; (2) as regards other organs, especially the kidneys.

Although (apart from publication in the medical journals) upwards of two hundred circulars, asking for information, and containing the foregoing suggestions, were distributed in various parts, over almost the entire surface of the kingdom, and notwithstanding that, several weeks after the distribution, the attention of many of the non-resident members of the Society was particularly directed, by a brief note, to the importance of giving the information sought in the circular, the Committee regret to have to state, that during the ten months that the inquiry has been kept open, they have received only *thirteen* specific reports on diphtheria, and *twenty-two* replies,

in which the writers state, in very general terms, either the entire absence of diphtheria from their localities, or a lack of personal, or a very slight acquaintance with the disease.

Subjoined is a list of the names and places of residence of those members and other gentlemen who have favoured the Committee with reports and communications:—

	Dr. Hoskins, F.R.S.	Guernsey.
South Eastern Counties.	T. H. Smith, Esq.	St. Mary Cray, Kent.
	Dr. F. J. Brown	Chatham „
	G. Rigden, Esq.	Canterbury „
	John Sladden, Esq.	Ash
	R. H. Barker, Esq.	Hungerford, Berks.
S.-Midland Counties.	E. Daniell, Esq.	Newport Pagnall, Bucks.
	Dr. T. H. Barker	Bedford.
Eastern Counties.	T. Spurgin, Esq.	Saffron Walden, Essex.
	— Jones, Esq.	Ditto „
	H. Laver, Esq.	Colchester „
	G. Kelson, Esq.	Sevenoaks „
	Dr. W. L. Crowfoot	Beccles, Suffolk.
	H. W. Bailey, Esq.	Thetford, Norfolk.
S.-Western Counties.	W. C. Lake, Esq.	Teignmouth, Devonshire.
	Dr. R. W. Falconer	Bath, Somerset.
West Midland Counties.	J. B. Davis, Esq.	Sheldon, Staffordshire.
	J. M. Turner, Esq.	Newcastle „
	R. Garner, Esq.	Stoke-upon-Trent „
	Dr. Norris	Stourbridge, Worcester.
	A. Freer, Esq.	Ditto „
N.-Midland Counties.	Dr. R. U. West	Alford, Lincolnshire.
	Dr. W. Newman	Fulbeck, Grantham.
N.-Western Counties.	Dr. D. Noble	Manchester.
	J. B. Harrison, Esq.	Higher Broughton, do.
Yorkshire	J. Hardwicke, Esq.	Rotherham.
Northern Counties.	W. B. Page, Esq.	Carlisle, Cumberland.
	Dr. Elliot	Ditto „
	W. L. Dickinson, Esq.	Workington „
Wales.	Dr. Moffat	Hawarden, Flintshire.
	Dr. T. Williams, F.R.S.	Swansea, Glamorganshire
	W. H. Michael, Esq.	Ditto „

In consequence of the small number of reports transmitted to the Committee, the results of the present inquiry are altogether insufficient to form a basis for a general history of the rise and progress of diphtheria in the kingdom. Nevertheless, the information which has been received respecting the disease is not without value, (1) from the additional light which is

thrown, in several respects, upon the development of the epidemic; and (2), as showing the highly important knowledge which might be obtained respecting epidemic diseases from an inquiry such as that conducted by the Committee, if it were generally supported by the members (particularly the non-resident members) of the Society.

The Committee conceive that they will best conclude the work deputed to them, and most clearly show the value, as well as the deficiencies, of the inquiry they have conducted, by a simple analysis of the reports and correspondence forwarded to them.

1. In those localities from which reports of the occurrence of diphtheria have been received, the disease first showed itself, with one exception, in the course of the years 1857 and 1858, during which years diphtheria was manifested in an epidemic form in many parts of the kingdom. The following dates of the first appearance of the disease in certain localities are given in the reports:—

Chatham, probably May 1857.

Canterbury, June 1857 (first clearly observed; but Mr. Rigden thinks that cases may have occurred before that month.)

St. Mary Cray, Kent.
Colchester, Essex.
Thetford, Norfolk.
Teignmouth, Devon.
} Summer of 1857.

Stourbridge, Worcestershire, January 1858.

Fulbeck, Lincolnshire, March 1858.

Alford, Lincolnshire, July 1858.

The exceptional instance referred to is this:—

Diphtheria, according to Mr. Sladden, of Ash, near Canterbury, appeared in that village at the beginning of November 1856, and continued, with some intermission, for rather more than twelve months. The first death occurred on the 9th of November, 1856; the last on the 19th of November, 1857. Mr. Sladden's interesting report is given in full in the Appendix.

This statement may probably prove of importance in connection with two other statements elicited by the question (2) of the Committee respecting the prevalence of diphtheria prior to the present epidemic.

Dr. F. J. Brown, of Chatham, states, that diphtheria had occurred in that town and vicinity previous to the existing epidemic, both in connexion with scarlatina and separately. In 1851, cases of diphtheria were noted by him at Strood, Rochester, in the months of March, May, July, August, and September. Cases, also, were recorded by him in the same

vicinity in 1852, 1853, and 1854; and he believes that instances of the disease occurred, although not under his own observation, in 1855 and 1856.

Mr. Laver, of Colchester, states, that three cases, which were developed during convalescence from typhoid fever, and two of which proved fatal, happened in an isolated house, ten miles from that town, in April 1854. Mr. Laver records these cases on the authority of a friend, since dead.

It would appear, then, that sporadic cases of diphtheria had occurred in Kent and Essex prior to the present epidemic outbreak of the disease.

This fact has an important bearing upon the history of the development of the epidemic, particularly in reference to the question of its introduction into the kingdom from without. The epidemic first showed itself clearly at the commencement of 1857* in the south-eastern counties, in which the sporadic cases recorded above are said to have occurred. It may be, then—and when we consider the comparative rarity of the disease previous to the epidemic, it is not improbable—that the epidemic arose from causes acting entirely within the boundaries of the kingdom, that, in fact, in relation to the kingdom it was of intrinsic and not of extrinsic origin. There are other facts recorded, in addition to the statements made by Dr. F. J. Brown and Mr. Laver, which support this view. In October 1850, Dr. Bennett read a paper before the Medical Society of London, detailing certain cases of undoubted diphtheria, which had occurred in his practice (in the metropolis?) that year;† and Mr. J. D. Brown, of Haverfordwest, Wales, has recorded a serious outbreak of the disease which occurred at that place in the autumn and winter of 1849, the disease continuing until the spring of 1850. His description removes all doubt as to the character of the disease; and he states that at least two hundred cases, of which forty proved fatal, were noted during the outbreak.‡

It is proper to remark, that the most recent epidemics of diphtheria in Paris and Boulogne broke out in 1855.

We may fairly assume, then, that the present epidemic of diphtheria has been gradually developed during the last ten years within the kingdom; and it would be of great advantage to epidemiological science to trace the progress of the development step by step, in the different localities in which the disease has been manifested. Moreover, it would be of still more

* Hart on Diphtheria, p. 18. † Medical Times and Gazette, vol. xxii, p. 418.
‡ Medical Times and Gazette, vol. xxii, p. 670.

importance, and would doubtless lead to greater results, to watch for the development of the disease in those districts in which it has not yet appeared. In consequence of the comparative rarity of diphtheria previous to 1857, and particularly from the absence for a great and doubtful length of period, of any previous general epidemic manifestation of the disease, the present epidemic offers a rare opportunity for studying carefully the rise and progress of such outbreaks; and it is still not too late to recover trustworthy accounts of the initial stages of the existing outbreak. The Committee, therefore, strongly urge the propriety of a further appeal to the members of the Society and the profession, for additional information respecting previous examples of diphtheria within their experience, as well as for more accurate details of the earliest cases observed by them during the present epidemic.

Dr. Norris, of Stourbridge, Worcestershire, has given the Committee some most interesting information respecting earlier examples of diphtheria in his practice. He writes:—

"I have seen many cases answering the description of diphtheria, the last twenty years, most of them, I think, fatal—generally in the children of the poor. . . . . I remember a poor woman, some fifteen years ago, losing all her children, four in number, all, I think, within nine days, the oldest not more than eight or nine years of age; she resided in a small house, close to a nasty warehouse, where putrid fat was converted into candles. Two medical men had been much puzzled by these cases; the first medical man thought the children had been poisoned; the last requested my opinion on the only surviving child, not many hours before death. From the hoarseness, etc., I drew his attention to the throat of the child, which had not been examined. On inspecting it, I found loose and firm coatings of yellowish lymph in the fauces; and on the skin, here and there, a faint red rash. In those days, I pronounced it irregular malignant scarlet fever: the child died with difficulty of breathing and coma. I think these children must have died from diphtheria; for I cannot possibly believe that two experienced medical men could have overlooked the sufferings of children with sloughing throats. I well remember going away from this and other cases much dissatisfied with my own knowledge.

"A strong boy, aged 3, had a red rash on his body, not well developed, and an inflamed throat, which I considered scarlet fever. He progressed favourably nearly a week, when fever and debility increased; and now I found the fauces coated with a diphtheric secretion; the whole throat appeared firmly

coated as if with a thin layer of chamois leather. The child had a hoarse cry, and daily became more enfeebled and exhausted, rejecting everything but small quantities of liquids, which were frequently forced down his throat. Large portions of the buffy substance often came away; and the child slowly recovered, after suffering severely. Desquamation of the cuticle followed; glands of the neck enlarged.

"I have related these two cases, as a milder species of diphtheria, presuming that it may sometimes be connected with scarlet fever; and perhaps it most frequently occurs when the rash most faintly appears. This case treated similar to first case."

Mr. Spurgin, of Saffron Walden, also writes:—

"About thirty-five years since, I suffered severely myself from exposure at night to cold and damp, in a cold cottage, which resulted in the formation of a false membrane in the larynx and trachea; not at first attended with cough, or much derangement of health, but with debility and loss of voice. Gradually the health became impaired, a troublesome cough came on, the membrane became decomposed, and was brought up in fœtid portions, greatly reducing the health and strength, and followed by a very slow and tedious recovery; but the parts have never regained their original tension and tone."

The only other information received respecting the previous occurrence of diphtheria or diphtheric affections is from Dr. Hoskins, of Guernsey. He states that, in 1820 and 1821, scarlet fever was very fatal in that island, "being accompanied by that peculiar inflammation of the throat called by Bretonneau *diphthérite;* and again, in 1838 and 1849, it assumed a congestive form complicated with inflammation of the lining membrane of the frontal and other sinuses. Defluxion of acrimonious fœtid mucus took place from the nostrils; and almost all cases so affected terminated fatally by the supervention of cerebral symptoms."

This sentence is quoted from a tract on the *Climate of Guernsey,* published by Dr. Hoskins in 1846; but in a recent letter, this gentleman gives the following opinion and additional information:—

"It is my firm conviction that the scarlatina epidemics of 1838 and 1849 had a diphtheric character, although the throat was not so decidedly affected as it was in 1820. The features which were present in 1838 and 1849 were a malignant sort of coryza, accompanied by serous, purulent, and sanious discharges from the nares; this discharge being so virulent as to produce whitlows in the fingers of the attendants. The lining membrane of the frontal and other sinuses must have been

severely affected; and in most cases coma supervened. I do not think that any patient affected by this virulent coryza recovered."

It is worthy of remark, that Dr. Hoskins denies the presence of diphtheria in Guernsey in the winter of 1858-59, although several cases were reported to have occurred in the hands of homœopathic practitioners. Other correspondents allude to the too commonly careless and unjustifiable use of the term diphtheria.

In reference to the mode of development of the present epidemic, an interesting and suggestive illustration is furnished by Mr. T. H. Smith, of St. Mary Cray, Kent. In that village, three cases of the disease occurred in the summer of 1857; but from that period until Midsummer 1858, no other case was observed. From this time, however, until June 1859, eighty-four examples of the disease were recorded.

This is a clearly marked example of that law of epidemic development which has been so plainly manifested in cholera outbreaks; to wit, the occurrence of one or more cases of the disease, or *groups* of cases, at a greater or less period of time before the full outbreak of the epidemic.

II. The information given to the Committee in answer to their third query—(What was the prevailing character of the throat affections which occurred contemporaneously with diphtheria, or, that disease being absent, what has been the character of the throat affections which have come under your observation recently; have those affections prevailed to a greater or less extent than in previous years, and have any of them been contagious?)—although insufficient for the formation of any definite conclusions, is of considerable importance as directive of further inquiry.

In respect to the throat affections prevailing contemporaneously with diphtheria, Mr. Smith, of St. Mary Cray, writes:—

"During the past two years, at least, there have occurred numerous cases of congested throat of various degrees of intensity, but without ulceration until the last few months, when superficial abrasions more than ulceration have appeared; but in some few cases more marked ulceration, *occasionally (very rarely) with the membrane, but chiefly without.* A few cases of tonsillitis and quinsey, but not more, probably, than in ordinary years. The 'abrasions' give the throat a mottled or streaky appearance, and the type is asthenic."

Dr. Brown, of Chatham, writes:—

"Throat affections have been excessively prevalent—more

so than I can remember at any other time. There have been hundreds of cases of sore throat. There have been several kinds.

"(A.) Laryngitis.

"(B.) Pharyngitis.

"(*a.*) Preceded by amygdalitis; or (*b.*) succeeded by amygdalitis.

"(C.) Ordinary amygdalitis.

"(D.) Exudative diphtheria.

"Very scarce indeed in this district. Other medical practitioners find the same to be the case. They speak of cases; but when questioned, it turns out that their cases have not been marked by the true characters. None of the throat affections have been contagious."

Mr. Barker, of Hungerford, states that an inflammatory type of throat-affection, sometimes proceeding to suppuration in one or both tonsils, with enlargement of the cervical and parotid glands, had been more than usually prevalent.

Mr. Laver, of Colchester, states that cases of tonsillitis, "which have appeared to be contagious in a certain degree," have been more prevalent than in former years; in fact, that these cases have been "very prevalent."

Mr. Rigden, of Canterbury, has forwarded an exceedingly interesting table, showing the cases of diphtheria, pharyngitis, stomatitis, croup, cancrum oris, and scarlatina, which have occurred in his practice in each month of the two years 1857 and 1858. He has also communicated a table showing the mortality in the city of Canterbury from the same diseases during the same period.

From these tables, it would appear that scattered cases of diphtheria occurred in Canterbury in the months of June and July 1857; that in September of the same year the epidemic had fully set in, and that it continued, with an intermission in December, until July 1858, the maximum number of deaths in any one month occurring in October 1857; the maximum number of cases under Mr. Rigden's care within a similar period being in November 1857. Scattered cases of the disease occurred in October and December 1858, the brunt of the outbreak apparently having terminated in July of the same year.

Now, during the two years 1857 and 1858, fourteen cases of pharyngitis had happened in Mr. Rigden's practice. Of these cases ten had occurred before the outbreak of diphtheria; two contemporaneously with the forerunners of the outbreak; one in the month (August) immediately preceding the fully developed epidemic; and *one only* after that development

Number of Cases of the following Diseases occurring in the practice of Mr. George Rigden.

	1857.												1858.												Totals.
	January.	Feb.	March.	April.	May.	June.	July.	August.	Septem.	October.	Novem.	Decem.	January.	Feb.	March.	April.	May.	June.	July.	August.	Septem.	October.	Novem.	Decem.	
Diphtheria	..	..	..	..	..	..	..	..	2	6	10	..	8	3	8	3	7	2	5	..	..	..	..	1	55
Pharyngitis	..	3	..	3	4	2	..	1	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	14
Stomatitis	..	..	..	..	..	1	4	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	5
Croup	..	..	..	..	..	1	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	1	..	3
Cancrum oris	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1
Scarlatina	7	..	2	2	3	2	10	8	1	2	2	..	5	..	..	..	1	..	..	10	2	..	..	..	57
Totals	7	3	2	5	7	6	15	9	4	8	12	..	14	3	8	3	8	2	5	10	2	..	1	1	135

Mortality in the City of Canterbury from the following diseases. From the Register of Deaths.

	1857.												1858.												Totals.
	January.	Feb.	March.	April.	May.	June.	July.	August	Septem.	October.	Novem.	Decem.	January.	Feb.	March.	April.	May.	June.	July.	August.	Septem.	October.	Novem.	Decem.	
Diphtheria	..	..	..	..	..	1	1	..	2	4	2	1	3	2	2	3	..	3	1	..	..	1	..	..	26
Pharyngitis	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1
Stomatitis	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	2
Croup	2	1	..	1	..	..	..	..	..	..	..	..	2	1	..	..	1	..	..	..	..	2	1	11
Cancrum oris	..	..	..	..	1	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2
Scarlatina	4	2	2	2	1	..	1	..	1	..	2	..	..	..	..	..	..	1	..	1	2	..	..	..	19
Totals	6	3	3	3	2	1	3	1	3	4	4	1	5	3	2	3	1	4	1	1	3	1	2	1	61

(September). The cases of stomatitis, five in number, occurred contemporaneously with the forerunners of the epidemic in June and July. The cases of croup, eleven in number, occurred in January, February, and April, 1857; January and February, June, November, and December, 1858. The cases of cancrum oris occurred in May and July 1857. Thus, then, so far as these affections are concerned, with the exception of croup, it would seem as if they had been merged in the diphtheria epidemic. An almost similar remark, as will presently be seen, would be justified in reference to the scarlet-fever, which prevailed in Canterbury in 1857-58.

Mr. Lake, of Teignmouth, Devon, records the occurrence of nine cases of tonsillitis in his practice in October and November 1857, seven of which cases were characterised by unusual prostration, and four died—one succumbing from bronchial complication. In one family three cases occurred, one of which died; and the two that recovered suffered from scarlet fever in November 1858, twelve months after the tonsillitis, which had yielded readily to treatment. There had been no cases of scarlet-fever in the neighbourhood since 1856.

In the fatal cases of tonsillitis, the tonsils had presented simply a red and swollen aspect, and in one instance the swelling was very considerable. In a case, seen first by Mr. Lake on the 20th November, 1857, he describes the tonsils as being "swollen, red, *and covered with a tough white coat*, the uvula red but not coated."

Previous to September 29, 1857, Mr. Lake had had only eleven cases of tonsillitis in his practice, all of which were ordinary cases of the disease; but during the first three-quarters of 1858 he attended twenty-one cases of the same affection.

Mr. Bailey, of Thetford (in which town about five cases of diphtheria were recorded), notes the occurrence of ordinary cases of tonsillitis; but these cases seemingly were not in excess, neither did they differ in character from those usually observed at the same periods of the year in the absence of diphtheria.

Dr. Norris, of Stourbridge, writes: "Throat affections have been extraordinarily prevalent the last nine months. Some had long ulcers at the back of the fauces; others smaller ones on the tonsils, without any rash; many had them in the same house. I think they must be infectious. In my practice, these throat-affections appeared months before I saw diphtheria."

Mr. Freer, also of Stourbridge, writes, moreover, that "during the past eight months, throat-affections of various kinds have been very prevalent. Elongated uvulæ, simple relaxation of the faucial mucous membrane, acute tonsillitis, vesicular sore-throat with a varicose state of the vessels of the tonsils, tenderness and swelling of the submaxillary glands, have all been frequently seen by me during the time spoken of. Ulceration in several cases of scarlatina has been very marked, and occasionally fatal. Indeed, the throat has lately suffered much more than at any time of my experience (ten years). *Hysteric* throat also has been exceedingly common in those attending diphtheritic patients."

Mr. Freer adds the following important remark :—

"In calculating the increase of throat-maladies, it is well to remember that very many cases of slight ailments come under notice which would not have been brought under the notice of a medical man, were the public not thoroughly alarmed at the name 'diphtheria'."

Dr. Newman of Fulbeck, Grantham, writes :—

"During the last twelve months affections of the throat have been exceedingly common; my note-books shew a great increase in all the affections of the tonsils, larynx, etc., over the preceding three years. I would, from observation, make the following division :—

"(*a*). Simple sore throat, with more or less of constitutional disturbance, lasting three or four days; readily yielding to treatment, or, in the absence of any means, not lasting many days; simple redness of tonsils, uvula, back of pharynx, upper and posterior part of palate; no ulceration or breach of surface, and no co-existent false membrane.

"(*b*). A more severe affection of the throat, exhibiting much deeper tinge of redness over tonsils, palate, and fauces; more difficulty of swallowing present as a rule than in (*a*), (though I have noticed the dysphagia to be almost entirely absent in several of the cases); co-existent patches of whitish or yellowish-white exudation, very small in size, say from size of a pin's head to seven-eighths of an inch in diameter, preserving more or less of circular character; present as a rule on the internal face of the tonsils, and not seen on the palatal surface or on the back of the pharynx; as a rule, very readily amenable to treatment, subsiding in from four to seven days.

"I believe this might be spoken of as 'mild', 'incipient', or possibly even 'abortive' diphtheria. I have seen it occur in one member of a family, and this (the first case) followed by true diphtheria in the others; and again, in *one* instance,

a boy, whose throat presented on the Monday these characters, exhibited on the Wednesday the exudation of true diphtheria.

"(*c*). Ulceration of throat; distinct and actual destruction of tissue; dysphagia great; constitutional disturbance varying much in different instances; deep dusky redness of throat; affection lasting eight or ten days, or more; to be traced, I believe, always to scarlatina poison; in several instances coexistent eruption (characteristic) on the skin; the sloughs have edges well defined, and are usually somewhat hollowed and concave.

"(*d*). Diphtheria proper; coriaceous exudation of yellowish or whitish material; distinguished from (*c*) by the exudation having ill-defined edges, much more extensive; rapidly reformed on removal; no actual breach of surface beneath; exudation loosely attached, often convex from existence of effused matters beneath it.

"Cynanche tonsillaris has been exceedingly common; laryngitis (acute and subacute) has been seen in five or six instances, and croup also has proved more frequent than usual.

"I believe, in short, that throat affections have in this district been more frequent than usual, both as maladies *per se* and also as intercurrent affections, and that they have proved, in almost every instance, more intractable and of longer duration than I have usually seen them."

Mr. Hardwicke, of Rotherham, states that throat-affections have been more prevalent than usual, and he notes "erysipelatous inflammation, and in some instances quinsey." He states, also, that he has "not met with an instance of contagion."

In regard to places in which diphtheria has not occurred during the present year, the information given is most scanty.

Dr. Hoskins, of Guernsey, states that during the past winter common forms of sore throat were prevalent in that island; and Mr. Daniell, of Newport Pagnell, writes:—

"Sore throat has prevailed extensively during all last summer and this winter, and been exceedingly intractable, returning again and again, but the character of the disease has not approached diphtheria. The pharynx and uvula, in most cases, have been deeply injected, and white ulcerations have appeared on the palate, the tonsils, the velum, etc., but nothing like an adventitious membrance or unusual exudation. These cases, after long and tedious treatment, have yielded to agents exceedingly different in character.

"I cannot but think the existence of even the class of cases of sore throat which I have met with may be due to the poison

which generates *diphtheritis* proper. I have noticed while Asiatic cholera prevailed in some parts of the country as a terrible scourge, and we were exempt from it, yet there existed a larger amount of bowel complaints amongst the people than happened at the same season when the country was free from the epidemic."

III. With regard to the *contagiousness* or not of the disease (4th query), the majority of the correspondents have not been able, from their experience, to form a definite opinion. Mr. T. H. Smith, however, writes:—

"At first I thought the disease non-contagious, but a few facts have occurred to convince me that it is *contagious*. A person going home to a distance where no case had occurred, has communicated it to the nurse in immediate and close attendance, the disease showing itself within seven or eight days."

Mr. Jones, of Saffron Walden, writes:—

"I have not been able to trace satisfactorily any period of incubation; but from several successive instances occurring in families and nurses, I have no doubt of its contagiousness, although it may be said that these cases have arisen from the same predisposing causes. The children of one family suffering from diphtheria have affected another family associating with them. Other instances have occurred of those nursing a patient having suffered from the disease."

Dr. Newman, of Grantham, writes as follows:—

"I am of opinion that the disease is unquestionably contagious, and derive this opinion from the following facts.

"1. The first case I saw was in a maid servant in a gentleman's family, on March 1, 1858, the form of disease not very severe; that is, it was arrested speedily by remedies used. No other cases had happened in the village, or for some few miles round; and the members of the family had not been away from home. The mistress, within ten days of the servant's seizure, was also taken ill with the same affection; and two children, within twenty-one days, also exhibited the disease. A maid servant was taken ill a month after the occurrence of the first case, and a fortnight after the last case, and died from exhaustion within a week. (This last case I am not personally cognisant of.)

"2. A labourer, aged 45, had been into Cambridgeshire, to a village where diphtheria was prevalent. Within fourteen days after his return home, he was seized with the disease; and, after six weeks illness, died apparently from exhaustion. Three children took the disease (ten, seven, and five years of age re-

spectively) within fourteen days of their father's seizure, and all died within a week. (The above account I give on the authority of the mother.) A fourth child, aged 12, was brought to me with unquestionable diphtheria, and with early and free treatment recovered.

"3. A farm boy, aged 19, had been living at Wilsford, a village where diphtheria had been for some weeks, both in its milder and more severe form. He was taken ill, and went to Gilston, to his father's (this, a village six miles distant, in which no cases of diphtheria had occurred prior to his arrival). On the seventh day after his going home, when he was personally all but well, two of the other children (male 10, female 7 years of age) took the disease and recovered. Ten days afterwards, two children living in the next house, adjoining and indeed under the same roof, were seized with diphtheria (two girls aged 12 and 10 years) in its severe form. The younger of the two died in two days after first complaint of the throat.

"4. A child had the disease in Leadenham (came from a village in the Fens, where diphtheria was very common). F. G., the only other person who had diphtheria in the village, was the child of a neighbour who was constantly going in and out of the house."

v. In reference to the connection of diphtheria with scarlet fever (fifth query), the following suggestive information is given.

Dr. Hoskins of Guernsey (as already quoted) mentions the occurrence of an epidemic of scarlet fever in that island in 1820-21, accompanied by diphtheric affection of the throat.

Mr. Smith (St. Mary Cray) writes:—

"I have not seen diphtheria in connexion with scarlet fever except in one family—that of a clergyman at Paul's Cray. In that family I had three cases of well marked diphtheria, four of scarlet fever, and two of measles, *at the same time.*" Mr. Smith also adds, in respect to the coexistence of cutaneous eruptions with diphtheria—"I have observed serous blebs on the fingers, urticaria (especially during convalescence), erysipelas, and some very remarkable cases of pompholyx."

Dr. F. J. Brown (Chatham) states that in former years he has seen "diphtheria occurring during scarlatina, concluding the illness by death."

Mr. Jones (Saffron Walden) writes:—

"The only point in this district in which diphtheria has come under my notice, namely, Rodwinter (?), was visited two years and a half since with a most severe epidemic of scarlet

fever of a malignant character, with many fatal cases. I have not observed that the families which then suffered have especially escaped the present disease under notice. I have not seen the coexistence of any cutaneous eruption with diphtheria."

Mr. Laver (Colchester) writes :—

"Several patients suffering from diphtheria have also had previously scarlet fever; the majority have had diphtheria without being in communication with scarlet fever patients, or having themselves suffered from it. I have not observed any cutaneous eruption occurring at any period of the disease."

Mr. Rigden (Canterbury) states :—

"In one family only have I observed scarlatina and diphtheria present at the same time in different members. In this family the two diseases were very distinct. The diphtheria patients had no eruption on the skin; the scarlatina patients no false membrane on the fauces; and yet there seemed no reason for the exemption in either case; for those who escaped the scarlatina were reported not to have had it previously."

The tables sent by Mr. Rigden show that, while eighteen cases of diphtheria occurred in his practice in September, October, and November 1857, thirty-nine cases of scarlatina had occurred in the ten months January and March to November of the same year; whereas, while thirty-six cases of diphtheria came under his observation from January to July 1858, only six cases of scarlatina were observed during the same period; twelve cases occurring in August and September, when no examples of diphtheria occurred within his practice, or were indicated by the mortality records. No case of scarlet fever is recorded after September; but one case of death from diphtheria occurred in October, and Mr. Rigden attended a case in December. In fact, an outbreak of scarlet fever apparently occurred in Canterbury previous to the prevalence of diphtheria, gradually declined, and in great measure died out as the latter disease increased in intensity; and broke out again with renewed intensity, for a short period, when that disease ceased its ravages. It is noteworthy, also, in confirmation of this view, that of nineteen deaths from scarlatina in Canterbury, in the two years 1857-58, eleven took place before the epidemic of diphtheria, and three after its brunt had ceased—in fact, when the epidemic itself, with the exception of the straggling cases which happened in October and November 1858, was over.

In contradistinction to the experience of the Canterbury

outbreak, it would seem that at Shelton, in Staffordshire, scarlet fever and diphtheria prevailed contemporaneously. Mr. Davis writes:—

"Very serious cases of *scarlatina maligna* have prevailed in the district for a considerable time. These have had throat affection almost always. They have been very fatal.

"The first fatal case of diphtheria in the Shelton district died December 4th, 1858; three others died in December; two died in January; one in February; and two in April; making nine fatal cases registered 'diphtheria' in all, from December 1st, 1858, to May 20th, 1859. During this period, there have been registered thirty-nine fatal cases of scarlet fever; six of measles; nine of hooping-cough; and two of croup. But, what I consider is of more importance to mention is, there have been registered an undue proportion of some other diseases. Fourteen fatal cases of pneumonia, and five of bronchitis in infants and children, the oldest of which was six years. Two hundred and eighty-five deaths from all causes have been registered in the district from December 1st, 1858, to May 20th, 1859."

Dr. Morris, of Stourbridge, states that he "had one patient in a large boarding school, about thirty-five persons in the house, and rather small, situated near a graveyard, gas works, and other nuisances likely to produce epidemic disease. Scarlet fever and measles had been prevailing in the school three months; and those who did not take the epidemics, one and all almost suffered from sore throats or colds: whereas a blue-coat school in a more healthy locality, containing a hundred boys, not more than half a mile distant, was almost free from sore throat, or any other epidemic disease."

Mr. Freer, of Stourbridge, writes:—

"The deposit of a true diphtheritic membrane on the tonsils in scarlet fever, I have witnessed in more than one instance. Two patients I am now attending, with diphtheria, have had scarlet fever aforetime. Among my earliest cases were five children in one house; one after the other was taken; they lived fifty yards from two children who died at the same time from frightful rapid gangrene of the cheeks, such as I never saw before but in Paris. My next case of diphtheria was a child next door to the gangrenous-cheeked children. This was a very bad one; began on tonsils and uvula, then into larynx, all the mouth, on the lips (with ulcerations also). Symptoms were those of croup and remittent fever. Recovery, but with considerable closing up of the oral aperture, took place. The mouth is now so small as not to admit solids.

"As to eruptions, in two cases now under treatment, there appeared a general dusky mottling of the body, arms, and legs, on the third or fourth day, very like the suppressed rash of *scarlatina maligna.*"

Dr. Newman (Fulbeck) writes:—

"The patients with diphtheria have not had scarlet fever; they had not (so far as I could learn) been in communication with persons suffering from that disease; nor do I find that the children who escaped in the respective families (these, however, being very few in number) had been the subjects of scarlet fever. I have looked for a cutaneous eruption in diphtheria cases, but never met with it."

Mr. Michael (Swansea) writes thus:—

"Two cases of diphtheria have alone fallen under my notice. These were severe cases of scarlatina. The first, the child of a physician, Deputy-Inspector of Hospitals, R.N., living in a large house facing the sea, aspect nearly due south. Near the house large docks are in course of construction. The child was about seven years of age, female; the fever very severe, and the rash maculated. About the seventh day, white patches appeared on the tonsils, which appearances gradually spread until the larynx became affected. Swallowing was impossible, the breathing croupy, and the exhaustion extreme. Life was supported by port wine and beef-tea enemata every twelve hours, with ten grains of quinine. The little girl appeared recovering, the white appearances were entirely removed, swallowing power returned, when purulent deposits occurred in various parts of the body, and she sank from exhaustion.

"The second case was a lad of twelve years of age, in a clergyman's family, in a country house near the sea side—also affected with scarlet fever. This case pursued much the same course as scarlatina anginosa, and the boy eventually recovered.

"Sore throats extensively prevailed, but of no such peculiar characteristics as to call for any special remark. Both the cases above noted occurred in the beginning of January."

In connection with this letter of Mr. Michael, the following communication from Dr. Williams, of Swansea, has considerable value:—

"During the past two years, I have been engaged in a tolerably large practice, seeing about forty private patients, infirmary, and copper-works, and coal-works patients also, in variable number, every day. I have never yet seen a case of diphtheria, in what I conceived to be the strict and proper sense in which the cases of that disease should be defined; that is, no case in which a false albuminous membrane could be

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discovered on the fauces and pharyngeal cavity, or inferred from symptoms, to exist in the tracheal and bronchial tubes. During the past year, an epidemic of scarlet fever and small-pox has prevailed in this neighbourhood in a very severe form. I then visited about twenty-seven cases of scarlet fever every day for a period of about three months, and many cases of small-pox. In the houses (of workmen) in which the scarlet fever had broken out, and also in the neighbourhood of such houses, sore throats were very common occurrences. But in no single instance, out of the vast number of cases which I saw, could I discover one case which I could in strict signification call diphtheria. I was, notwithstanding, continually remarking that the sore throat cases were not common cases of tonsillitis; they seldom suppurated. Some few bore such close resemblance of the scarlatina sore throat, that I was compelled to define them as the throat of scarlatina without the skin eruption or the fever. I know this to be the experience of several of my medical friends in this neighbourhood. All the cases which fell under my notice were treated first by an emetic, or calomel and rhubarb purgative, and very soon afterwards with nourishing broths and wine; but in no single case was wine given in such enormous quantities as in the cases which are said to have occurred in London and other parts of the country. During the prevalence of the disease in this district, I repeatedly remarked that it was in truth a form of scarlet fever. I do not for a moment, however, wish to assert that diphtheria, properly so called, is related to scarlet fever. The solution of that problem (the true nature of diphtheria), I resign to others, who have seen and studied the disease."

V. In regard to the sanitary conditions of the dwellings in which diphtheria occurred (6th query), we learn that the disease did not happen in the fever-spots at St. Mary Cray; that in a solitary case, observed by Mr. Barker, at Hungerford, the sanitary conditions were good; that at Fulbeck, Grantham, they were generally good; and that at Saffron Walden they were about the average. At Colchester the greater portion of the cases occurred in fever-spots, and at Canterbury the disease was manifested generally but not universally in unhealthy localities. At Thetford the cases reported occurred in one of the official residences in the gaol under unfavourable sanitary circumstances. At Skelton and Rotherham, the sanitary condition of the dwellings was generally defective; at Stourbridge various; and at Ash the epidemic first broke out in the most unhealthy districts of the village.

VI. In regard to the particular occupations of persons

affected by the disease (7th query), Mr. Smith (St. Mary Cray) states that he has observed it chiefly among the upper and middle classes; but the correspondents from Saffron Walden, Colchester, Stourbridge, and Fulbeck, state that they have not observed it to prevail more among one class of society than another.

VII. The meteorological, geological, and physical-geographical data transmitted to the committee are too scanty and disconnected to aid their inquiry.

VIII. In reference to the age and sex of those who have been attacked with the disease, Mr. Rigden, Dr. West, Dr. F. J. Brown, and Dr. Newman have sent tabulated accounts of 151 cases treated by them. The following is a summary of these accounts:—From 0 to 5 years, 21; 5 to 10, 30; 10 to 15, 19; 15 to 20, 20; 20 to 25, 8; 25 to 30, 13; 30 to 35, 12; 35 to 40, 16; 40 to 45, 7; 45 to 50, 1; 50 to 55, 2; 55 to 60, 1; and one patient aged 77 years. The age of the youngest patient recorded was fourteen months.

The opinions of the remainder of the correspondents as to the age most liable to the disease coincide with the data furnished in the foregoing summary.

The sex is stated in a hundred and fifty-six cases, of which sixty-five were *males*, and ninety-one *females*.

IX. In regard to the symptoms of the disease, it is necessary to quote solely the excellent account given by Dr. Newman (Fulbeck, Grantham), which includes, and gives in greater detail, those recounted by other correspondents. He writes:—

"The symptoms of the disease, so far as I have noted them, are as follows:—

"1. *Invasion.*—Usually coming on with feeling of lassitude and uneasiness about throat, not amounting to pain. In some few cases, ushered in by smart rigor, with burning skin of reaction, quick pulse, headache, etc., etc., and in these instances complaints of even severe pain in the throat.

"The state of malaise may continue for some hours, or there may be almost typhoid depression.

"*Inspection of Throat.*—Gives in first onset a view of œdematous state of uvula and tonsils (I do not speak of this as constant, but as frequently occurring), followed in a few hours by deep and intense redness of mucous membrane of throat, with almost microscopic patches of exudation.—(See answer to question III.) I believe that this might be spoken of as almost the necessary commencement of diphtheria; then small patches coalescing as the exudation goes on from the affected surface.

"2. *Course.*—Constitutional disturbance not relieved; chills, with subsequent heat; appetite gone; pulse quick; tongue, almost from commencement, loaded with thick yellow fur; breath not affected; distressing headache, and very often much prostration; sleep disturbed; very great pain in swallowing; shooting pain up to ear very common; swelling of parotid, submaxillary glands, etc., may come on at any time, but not usually, so far as I have noted it, as a primary, rather as a secondary affection, after the first two or three days.

"*Inspection of Throat.*—Shows intense redness, with false membrane covering tonsils, uvula, and pharynx, tough, resistant, yellowish (in some one or two cases I have seen, *dark* in colour); this membrane tough and thick, almost like leather in consistence and appearance; convex, or even hanging in folds from mouth; when removed, bleeding may take place from sundry small points, but no actually raw surface, or destruction of tissue underneath; looks as if the mucous membrane had been scraped off.

"*Termination—Resolution.*—I believe the first appearance of this to be the diminution of redness; not any detachment of slough, but simply a decrease in the vivid colour of the mucous membrane round the exudation. This may not (so far as I have seen) peel off for some days, but it slowly shrivels up, loses its attachment, and at last is coughed up, leaving a small sore or abrasion behind it. The constitutional symptoms remit; sweating is the first favourable symptom, and a fall in rapidity of pulse; a decrease in the pain attendant on swallowing, and the loss of that tendency to syncope, etc., so marked in the earlier stages. If *death* result, it will take place either by *exhaustion*—the patient seeming to sleep his life away—or by *apnœa*, from extension of disease to rima glottidis, and consequent suffocation. These will be the earlier endings. If the case be prolonged, there may be death (as evidently in one instance) from supervention of low pneumonia.

"The consequences of diphtheria are not to be comprised only in the usual vague statement of 'debility, etc.,' but have a series of symptoms that seem almost peculiar to this disease; they specially refer to the nervous system.

"I have one case now recovering from diphtheria, F. 45, who has had paralysis of portio dura on the side most affected, with coincident paralysis of the laryngeal branches of the vagus, evidenced by loss of voice; and of the pharyngeal branches, evidenced by return of food through nose from loss of power over palatal muscles. The nervous supply to tongue (? from glosso-pharyngeal) has also been interrupted; tongue pro-

truded irregularly, and destitute of sensation in the half on the affected side of face.

"Aphonia has occurred, but only for a short time, in two other cases. Obstinate ulceration of interior of cheek, apparently from mal-nutrition of the part, has also occurred."

X. The duration of the disease is specified in thirty-three fatal cases, to-wit:—

2	„ 3 days.	3	„ 11 days.
2	„ 4 „	3	„ 12 „
5	„ 5 „	1	„ 13 „
3	„ 6 „	3	„ 14 „
4	„ 7 „	1	„ 17 „
1	„ 9 „	1	„ 18 „
4	„ 10 „		

Mr. Jones states that the duration of the cases which he observed, was from two to seven days; and Mr. Laver from twenty-four hours to a fortnight, or more. Dr. Newman believes the duration of the disease to vary, in its active stage, from seven to fourteen days; but many months (he states) may pass over before the disease is entirely recovered from.

XI. The general or chemical character of the urine is briefly noted by three correspondents.

Mr. Smith states that the urine was copious, pale, and of low specific gravity, depositing lithates towards recovery. A few cases of albuminous urine were observed by him.

Mr. Rigden remarks that he examined the urine chemically several times, "but no albumen was discovered."

Mr. Freer found albumen "sufficient to render the urine opalescent", on the sixth day of the disease, in one mild case under his care.

XII. No definite information has been given to the committee concerning the microscopical appearances of the false membrane, and of the exudations and secretions accompanying other forms of throat-affection prevailing at the same period as diphtheria.

XIII. The answers elicited by the query respecting the treatment of the disease are as follow:—

Dr. Brown, of Chatham, found no treatment of any avail; all the cases under his care died. He adds:—"In the throat-affections that were prevalent, the most useful treatment consisted in leeches applied to each side of the larynx (thyroid cartilage). The best medicines internally were very strong solutions of chlorate of potash, with large quantities of nitric acid, thus:—

℞ Chlorate of potash, one drachm to two drachms; dil.

nitric acid, three drachms to half-an ounce; water to six ounces. M. One-sixth part every two hours."

Mr. Jones, of Saffron Walden, lost *three* out of thirty-five cases. His treatment consisted in "local applications of strong solution of nitrate of silver, hydrochloric acid, and infusion of roses at the commencement; sesquicarbonate of ammonia, diffusible stimulants, and a liberal diet in the course and towards the end."

Mr. Laver, of Colchester, writes:—"Caustics have appeared most useful in the earlier stages of the disease; but all remedial treatment has been most unsatisfactory."

Mr. Rigden (Canterbury) writes:—

"The application of nitrate of silver to the fauces has checked the extension of the false membrane; and in some cases of inflamed fauces, etc., where diphtheria was expected, it has seemed to prevent its formation. Where the case has been seen early, I have generally commenced the treatment with a dose of calomel or hydrargyrum cum cretâ sufficient to act as a purgative, and often as an emetic. This has been followed by the chlorate of potash and tinct. ferri mur., occasionally with quinine, and always with strong beef tea and diffusible stimuli. I have not practised tracheotomy for this disease."

Mr. Freer of Stourbridge writes:—

"Chlorate of potash, in ten grain doses, frequently repeated through all stages in some cases; *syringing* the throat in young children *most important*, where the adventitious membrane is thick and copiously poured out. I am not satisfied with the *solid* nitrate of silver, although I have used it in most cases. The membrane is a long time detaching itself under its use. I use (I think with benefit) borax and honey gargles (two drachms to eight ounces) by means of a syringe very frequently, and linseed meal poultices round the throat when the glands are much swelled; but the constitutional treatment seems the most important, and I find nothing better than enemata of beef tea and port wine; children seem to revive under their frequent use. No experience of tracheotomy in this. Mineral acids with tincture of bark seem useful. Sesquicarbonate of ammonia, in effervescence, has been of much use in two cases, and the children take it very well.

Dr. Newman (Fulbeck) writes:—

"The most successful treatment appears to be the early destruction of the surface with some effective caustic; *e. g.*, hydrochloric acid. I have used this in every case now for some time, and with but two deaths that could be attributed

to the disease. I have applied it with a camel-hair brush mixed with equal quantity of honey, so as to form a thick syrup. The objection to the use of solutions of nitrate of silver, or to the solid stick, appears to me to consist in the artificial coating formed by that agent, which, at all events, to some extent hides the actual character of the parts implicated. I have also given wine, beef tea, *ad libitum*; tinct. ferri sesquichlor.; quinine in full doses; no purgatives; in short, no lowering medicine whatever; hot flannels relieve pain when used as external application."

Mr. Hardwicke (Rotherham), all of whose cases recovered, used lotions of liquor sodæ chlorinatæ, tonics, and a liberal diet.

Dr. West (Alford, Lincolnshire), who had upwards of eighty cases under his care, not one of which died, mopped the affected parts of the throat with a strong solution of nitrate of silver (one drachm to the ounce), and administered a mixture compounded of chlorate of potash, hydrochloric acid, and tincture of the sesquichloride of iron.

Mr. Sladden states that "the one great indication was to support the patient by every possible means." (See *Appendix.*)

In no case was tracheotomy resorted to.

XIV. The proportion of deaths to recoveries, as gathered from the different reports, may be summed up as follows:—

At Chatham, in Dr. Brown's experience, 100 per cent. died; at Saffron Walden, in Mr. Jones's practice, 8.5 per cent.; at Colchester, in Mr. Laver's practice, 30 per cent.; at Canterbury, in Mr. Rigden's practice, 23.6 per cent.; at Stourbridge, in Mr. Freer's practice, about 20 per cent.; at Alford, in Dr. West's practice, 0 per cent.; at Fulbeck, in Dr. Newman's practice, 15.5 per cent.; at Ash, in Mr. Sladden's practice, 19.3 per cent.

Thus we find the mortality varying in different localities from 0 to 100 per cent.; the average of the cases reported to the Committee (514 cases, 96 deaths) being 18.6 per cent.

The *mode of death* is specified in twenty-two cases only. Twelve died from *exhaustion;* one from *hepatitis* on the third day; three from *laryngitis* (one on the second, and one on the first day); five from *suffocation,* and one from *asthenic pneumonia.*

XV. In no case was a *post mortem* examination made.

Conclusions.—If now we sum up the facts of chief importance which have been ascertained by this inquiry, we find—

1. The occurrence of sporadic diphtheria in the county of Kent in the years 1851-52-53, and 1854, and probably also 1855-56, and in the county of Essex in the year 1854.

2. The probable occurrence of sporadic diphtheria in different parts of the kingdom, at intervals within the last twenty years.

3. The unusual prevalence of throat affections of all kinds, and not unfrequently of a peculiar kind (apparently, if we may so phrase it, of a *quasi*-diphtheric character), prior to or contemporaneously with the present epidemic of diphtheria.

4. The concurrent or intercurrent prevalence in the same locality of epidemic diphtheria with epidemic scarlet fever, and the occasional occurrence of a diphtheric affection of the fauces in scarlet fever.

The whole of these facts have an important bearing upon the history of the development of the present epidemic of diphtheria—

(*a.*) In reference to the introduction of the disease into the kingdom from without:

(*b.*) In reference to the causes which have led to the development of the epidemic:

(*c.*) In reference to the relations of the disease to cognate affections and to scarlet fever.

Upon all these points the foregoing facts are valuable as suggestive of further inquiry, and as indicating the direction in which that inquiry should tend, as well in those districts in which the epidemic has prevailed, as in those in which it now prevails.

5. The doubtful contagiousness of the disease in some districts, its *undoubted* contagiousness in others.

6. The insanitary state of the majority of the localities in which the disease occurred.

7. The greatest liability to the disease being in the first decennium, or, to narrow the question, the second quinquennium of life.

8. The proportion of *males* in one hundred cases being 42.3; of *females*, 58.2.

9. The nature of the treatment indicated:

(*a.*) The application of more or less stimulating or caustic applications to the diseased parts;

(*b.*) The regulation of the excretions;

(*c.*) The sustentation of the powers of the system.

In concluding this report, the committee would remark, that although the information obtained by them in the present inquiry is exceedingly imperfect, yet it is sufficient to show that if the inquiry had been supported by the members of the Society to the extent that the committee had hoped it would have been, a large amount of most valuable information re-

specting diphtheria would have been obtained—information of a character that can be obtained in no other manner than by the systematic co-operation of many and widely separated observers to one and the same end. The committee would suggest that the Society should take into consideration the propriety of adopting other and additional means (if such can be devised) for promoting or insuring a more satisfactory co-operation of its members in such inquiries as the Society may set on foot; for the committee feel assured that the present inquiry has proved less successful than might have been anticipated, not so much from indisposition of the members to aid, as from an erroneous estimate of the value of the information which they possessed relative to the subject of inquiry. Thus in the majority of letters with which the committee have been favoured in answer to their circular, the writers have contented themselves simply with stating that diphtheria has not appeared in their neighbourhood, or that they have seen but one or two cases of the disease, and that consequently their experience would be of no value to the committee, notwithstanding that the committee had specifically asked for particular information respecting the prevailing character of throat affections where the disease had not manifested itself, and for many items of information where it had, even if it were but in a solitary instance.

The committee would further suggest, in respect to the present inquiry, that additional information should be specially sought concerning the points referred to in the 1st, 2nd, 3rd, and 5th queries contained in their circular, and if the Society should decide upon the fitness of adopting this suggestion, the committee are perfectly willing to continue their duties for such a period as may be deemed desirable.

Note. The Committee, at the request of the Society, seek further information on the points noted in the Report. Address of Secretary, 32, *Guildford St., Russell Square, London, W.C.*

APPENDIX.

I.—*Diphtherite at Ash, next Sandwich. By John Sladden, Esq.*

In attempting to furnish some account of the throat-affection which was epidemic in this village for the space of a year, or thereabout, and which proved fatal to a very large number of children, I must premise that my own state of health prevented me from

seeing much of the disease during the first few months of its prevalence; and the same inability to use much exertion may account for my apparent neglect in not making an attempt (in some instances) to overcome the reluctance of parents to permit a *post-mortem* examination of their deceased children, which I should assuredly have done had I been equal to the personal superintendence of such investigations.

The peculiar affection now designated by the term "diphthérite," first appeared in this village at the beginning of November 1856, and continued, with some intermissions, for rather more than twelve months. The first death occurred on the 9th of November in the former, the last on the 19th of November in the latter year. Its chief characteristics were—an entire absence of premonitory symptoms; sudden pyrexia; a feeling of uneasiness about the fauces during the act of deglutition; enlargement of the tonsils and parts adjacent, followed, or rather accompanied, by an exudation which was rapidly converted into what is commonly termed false membrane. The most remarkable symptom was the rapid and complete prostration of the vital powers; and to this low, asthenic condition of the system, the excessive mortality was, in my opinion, mainly, if not entirely, due. Within the period I have named, as nearly as I can compute, three hundred cases were treated by myself and my late partner, Mr. George Elgar, of this place. Of these, no less than fifty-eight were fatal. In several instances death occurred within twenty-four hours of the attack; more frequently between the third and sixth days. If the patient survived a week, the chances of ultimate recovery became greater every day. Like all epidemic diseases, especially those of a low type, it had its favourite localities; nor is it difficult to account for its affinity to those localities. The imperfect drainage of this village has been notorious for years past; but my repeated remonstrance was of no avail, and my repeated prediction of some frightful epidemic only laughed at. At the time of the outbreak there existed, at three distinct points, the like number of monstrous, palpable nuisances, two of them being holes used by pork-butchers wherein to deposit the blood, entrails, and other refuse of the slaughtered animals, and the third the drainage from a large brewery collected on the surface of the ground without the means of escape. These were all uncovered, and the effluvia given out from them, particularly in the evening, were unsavoury to the last degree. As might have been expected, these abominations formed three separate nuclei of disease. All the first, very many of the worst, and most of the fatal cases, occurred within an area bounded by a circle of some one hundred and fifty yards radius, having one of these "plague-spots" for its centre. In time the malady spread beyond these limits; but its commencement was precisely as I have stated. Two, three, and in some instances four children were carried off in the same family. Damp, ill-ventilated, over-crowded or uncleanly houses offered but small resistance to the entrance, but effectually

opposed the egress of the disease, and children with a scrofulous taint, as children inhabiting such dwellings usually have, were the earliest victims. What marvel that, with a combination of these untoward circumstances, the result should have been so calamitous! And yet, under more favourable conditions, the effect of treatment was marked and gratifying. At a very early period I arrived at the conclusion that the one great indication was to support the vital powers of the patient by every possible means; and the soundness of this view was proved by the recovery of several cases where recovery seemed almost hopeless. Left to themselves, the patients inevitably died; and I feel assured several did so die from a mistaken idea on the part of the parents that the children could not swallow, and their unwillingness to have them "disturbed." That deglutition was difficult and painful I have no doubt; but where the utmost repugnance was manifested for nutritious fluids, I have seen cold water swallowed in large quantities and with great avidity. Wine seemed especially distasteful; and, consequently, among the poor and ignorant, the use of wine was not persisted in, although freely supplied to them. With respect to medicine, a little more perseverance was shown; therefore, as a subscription had placed an ample quantity of wine at my disposal, I dispensed it in the form of a mist. cinchonæ, composed of equal parts of the decoction and port-wine, to be given every two or three hours, or oftener if required. Many children took this mixture with tolerable regularity, who were said to be incapable of swallowing wine. Chlorate of potash, combined with hydrochloric acid, was the first remedy adopted. Contrary, I believe, to general experience, I found no benefit from the use of this agent, and after a fair trial, it was discontinued. Then followed decoct. cinch. and the mineral acids, or the mixture of wine and bark already spoken of, and, still later, sulphate of quinine in large and frequently-repeated doses. I have no hesitation in saying this proved our sheet-anchor, and we used scarcely any other remedy for several months. As nutrients, strong beef or mutton broth, yolk of egg, jelly, port-wine, and occasionally porter, were administered as frequently as possible; and whenever it happened that parents and attendants could be impressed with the absolute necessity of continual feeding, the proportion of recoveries increased in a remarkable degree. I attach a minor degree of importance to local applications as a means of cure. The difficulty of applying them in very young children is considerable, and the impaired energy succeeding the struggles of a child in resisting their application is surely entitled to some consideration. Local remedies were tried when practicable. I never saw any good result from the arg. nitr. *after* the deposition of false membrane; but I firmly believe such deposit was occasionally prevented by its timely use. Nitric acid, diluted with an equal bulk of distilled water, appeared signally efficacious in a few cases. Sponging the fauces with a concentrated solution of the innocuous chlorides served to correct the

abominable fetor which always accompanied the disease, and I think promoted the separation of the adventitious membrane. I may observe that many of the people in this place were clamorous for purgatives; in some instances I know, in others I fear, they were given clandestinely. The effects were invariably mischievous —often irremediable.

Of the pathology of this malady, I am, unfortunately, in no condition to speak; consequently, any opinion I may have formed as to its nature would be of little worth. Still, I cannot avoid narrating one or two facts, which, unless they are mere coincidences, deserve to be remembered in considering the alliances and affinities of this strange disease. Previously to its outbreak there had been a few cases of scarlatina, mild in character, in the village, and they continued to occur, in limited numbers, after the diphtheritic attacks had become general. Is there any connexion between the two? In one family, six children fell ill within three days. Three of them had scarlatina as thoroughly and unmistakably developed as I ever saw—simple, unadulterated scarlatina. The others had not an atom of eruption; but they had the prevailing form of sore-throat, accompanied by the invariable deposit of false membrane, and the no less invariable depression. These children all did well; but the recoveries from scarlatina were by far the most rapid. On the opposite side of the road another child (an only one) had an attack of scarlatina about the same time; this child also recovered. In a cottage adjoining the last, in fact, under the same roof, a family of seven children were next attacked, one after the other, with diphthérite. These were about the worst cases I saw, and four out of the seven died. These events occurred in a small hamlet, at a short distance from the village. There are numerous other cottages in close proximity, containing the average number of children, none of whom have been affected in any way, so far as I am aware. My partner informed me of one instance in which diphthérite supervened on scarlatina after an interval of three weeks. In this instance the patient rapidly sank exhausted. Recovery from the former disease appeared to have been complete. Relapses from diphthérite were rare, but occurred occasionally. One girl of twelve or thirteen had three distinct attacks; the last was especially severe, but terminated favourably.

Is the disease contagious? It is difficult to say. Either contagionist or non-contagionist might have collected evidence here in abundance to establish, in his own mind, a proof of the correctness of his own views. Whenever the disease appeared in the outskirts, I could generally trace a direct communication with an infected house.

Regarding the seat of disease: false membrane was deposited generally on the mucous membrane enveloping the tonsils, soft palate, and parietes of the pharynx, less frequently on the uvula, and still more rarely on the base of the tongue. I saw only one case in which the air passages were implicated in which death

occurred very suddenly, apparently from suffocation. From the numerous patches of membrane evacuated *per anum* in some of the worst cases, I am led to believe that the œsophagus, stomach, and probably the small intestines, were more or less involved. One well-marked case of croup occurred during the twelve months. It was successfully treated by a less heroic method than would have been deemed orthodox some quarter of a century ago, or, perhaps, than would have been justifiable had the prevalent type of disease been of a more sthenic character. The general health of the village is now remarkably good; in fact, I never knew it so good at this, usually our most unhealthy season.

Ash, March 10, 1859.

II.—*An Account of an Epidemic of Diphtheria. By J. B. Sanderson, M.D.*

[Read before the Society, April 4th, 1859.]

The epidemic occurred in the small rural parish of Hertingfordbury, in Hertfordshire. This parish occupies a somewhat triangular space between the river Lea and its branch the Mimeran, which unites with it immediately above the town of Hertford. The epidemic was confined to the village of Hertingfordbury, favourably situated on a gravelly slope on the southern bank of the river Mimeran, and to a few small hamlets on the elevated ground between the two rivers, where the slight inclination and the impenetrable nature of the subsoil are alike unfavourable to the removal of surface water. The outbreak commenced at the end of October 1858, attained its acme early in December, and suddenly ceased towards the end of the year. Fifty-three persons were attacked in a population of seven hundred and fifty, of whom forty-seven were children. There were fourteen deaths, all of children under twelve.

1. Characters of the disease:—

Pain in the throat, generally inconsiderable, sometimes severe, either preceded by slight pyrexia or not; coryza occasionally preceding all other symptoms for some days.

Local changes.—Fauces at first congested; membranous exudation, commencing on one or both tonsils, usually within twenty-four hours from onset, spreading *continuously* to soft palate, uvula, pharynx; forming, when first seen, a white and perfectly opaque patch, with elevated edges, surrounded by a narrow border of bright carmine. It is soft and inelastic, and can be easily detached, leaving an intensely-congested, bleeding surface, free from ulceration. It is capable of separation into layers, and consists throughout its whole substance of nuclei and nucleated cells embedded in granular or dotted fibrine. The author inferred from his examination that the membrane, when first formed, consisted mainly of cellular elements, the later exudations containing more fibrine.

Condition preceding death in fatal cases.—In most cases, countenance pale, skin cool, pulse rapid and eventually so weak as to be imperceptible; no appearance of dyspnœa, the patient remaining in a condition of tranquil drowsiness, from which, however, he could easily be roused. In one or two instances there were paroxysms of suffocation, with cyanosis and violent jactitation. Extreme prostration during the remissions.

The urine was found to be albuminous in most of the cases in which the necessary observations were made; convalescence slow; loss of muscular power of lower limbs, impairment of vision, complete paralysis of the velum palati, frequently persisted for some time after restoration to health in other respects.

In the only *post mortem* examination which was made (no record was kept, the author was not present) the false membrane did not extend to the larynx. In this case there had not been the symptoms of suffocation.

2. *Causes—Drainage.*—In this respect, there was a marked contrast between the village of Hertingfordbury and the other hamlets in which the disease prevailed, the former being dry, the latter damp and ill drained, the cottages being situated on patches of common land, soaking with moisture. *Offensive emanations* were observed in none of the dwellings, which were all provided with detached cesspool-privies.

Water-supply.—All the cottages are supplied with water from wells from twelve to thirty feet deep. Owing to the diminished rain-fall during the autumn, these were dried up, or very low. A family, in which five children were attacked and four dead, being supplied from a well in this condition, the water was examined. It was found to contain living crustacea, protozoa, and protophyta, and vegetable organic debris in suspension, and organic impurity in the proportion of 5.2 grains in the gallon.

As none of these conditions were either peculiar to the localities affected or common to all of them, the author did not think that they could be considered of material importance as determining causes of the outbreak; and, as regards the whole district, he maintained that it might be favourably compared with most rural neighbourhoods.

Scarlatina and other diseases.—Several children were attacked during convalescence from measles and hooping-cough. Scarlatina occurred, but did not prevail during the epidemic. In one fatal case of diphtheria an eruption resembling that of scarlatina appeared on the third day. No instances were met with in which children affected with diphtheria had previously had scarlatina. This the author attributed to the fact that the latter disease had not prevailed in the district for some time past.

That the disease was capable of *transmission* by *personal communication* appeared from the mode of progress of the epidemic. When one case appeared in a family, all the children were usually attacked; and there was no instance in which the disease invaded

one family in a hamlet without extending to others. The origin of the epidemic could not be traced to this cause; but in the neighbouring parish of Tewin, four and a-half miles distant, the only two individuals attacked were in frequent communication with Hertingfordbury.

III.—*Report of a Case of Diphtheria on board H.M.S. "Cumberland," off Rio de Janeiro. By Alexander E. Mackay, M.D., Surgeon of H.M.S. "Royal Albert."*

[Read before the Society, April 4th, 1859.]

On the 24th day of October, 1857, Her Majesty's ship *Cumberland* being then at anchor in the harbour of Rio de Janeiro, Mr. Balfour MacNaghten, æt. thirteen, naval cadet, a very delicate, strumous-looking boy, was placed upon the sick-list with an acute attack of what appeared to be simple cynanche tonsillaris. There was a good deal of febrile excitement; the fauces were considerably injected, and the tonsils enlarged.

At the time of his being placed upon the list, the weather was very fine but hot, the thermometer being usually above 82°. There was a tendency to slight sore-throat among the ship's company generally; but of so very trivial a character were the cases which presented themselves that very few were added to the list. The prevalent disease—which was, indeed, almost epidemic—was diarrhœa, of exceedingly mild character, and easily brought under subjection.

Under the ordinary treatment for cynanche tonsillaris, to which he was subjected, Mr. MacNaghten rapidly improved; and on the evening of the 28th he was so well, and the inflammatory action had been so entirely subdued, that I fully anticipated being able to discharge him to duty on the following morning. During the night, however, it would appear that he was kept awake by a constant necessity to spit out what he called a large quantity of saliva, which continually collected in the throat, and which he himself attributed to his having taken some tea into which "egg-milk," of a rather stale character, according to his notion, had been put.

It is necessary to state here, that at this time we were at sea, having left on a cruize on the forenoon of the 27th. The difference in point of temperature was very grateful indeed to the feelings, the atmosphere at sea being seven or eight degrees lower than what we had it in harbour.

On the morning of the 29th of October I was much dismayed by finding a very marked aggravation of all his symptoms; and, on examining his throat, I found the uvula covered with a yellowish exudation, which I at once recognised as of a diphtheritic character. There was a constant tendency to expectorate, and great difficulty experienced in getting rid of what appeared to be collections of mucus upon or near the epiglottis. The skin was cool, and the pulse not much accelerated, but feeble. Every effort was made to

check the progress of this exudation, but without effect. The fauces were swabbed with strong solution of the nitrate of silver (one scruple to the ounce), and with a linctus composed of hydrochloric acid with thick syrup. Blisters and poultices were applied to the throat; the vapour of hot water, with camphor, was continually inhaled, and he took the chlorate of potash freely in his drink. The pulse rapidly increased in frequency, however, and was very feeble, and it became necessary to give him wine occasionally. The exudation spread over the fauces generally; and, although occasionally brought up in large masses, was speedily replaced. It appeared especially to collect in the vicinity of the epiglottis, and caused a peculiar gurgling respiration, which was exceedingly painful to listen to. The voice became very weak, but apparently more as a result of general debility than from the extension of the disease to the larnyx; inasmuch as occasionally, when he wished to call his servant, who might be at the opposite side of the cabin in which he lay, he spoke loudly and clearly enough, and there was neither stridulous cough nor breathing; stethoscopic examination showed the chest and air passages generally to be quite unaffected.

On the evening of the 30th, however, it became evident that the disease was rapidly gaining the mastery. At 8 P.M. the breathing was becoming much oppressed, apparently from the difficulty of getting rid of the exudation on and near the epiglottis. He became very restless, and it was thought advisable to try the effect of an emetic to assist in the separation and expulsion of the membrane. A scruple of sulphate of zinc was accordingly administered at this time. It acted very freely, and a large quantity of mucus was brought away with considerable masses of the membrane. The relief for a short time was obvious, but again the matter collected, and being exceedingly tenacious, could not be got rid of. The pulse gradually sank; the countenance became rather livid; there was much tossing of the head, and wandering delirium set in.

It was now determined to open the trachea; and tracheotomy was accordingly performed at 10.45 P.M. There was little or no hæmorrhage, and the only difficulty encountered was in clearing the tube of the matter which collected in it, and which the quill feather failed entirely to remove. There being no other alternative, I placed my lips to the tube, and by suction cleared it. This I had to do twice at least, and one of my assistants, Mr. Molloy, did it once. Immediately on the tube being cleared, the effect was very marked; the pulse rose, and he fell off into a quiet sleep. This continued for about two hours, when he awoke, and took a little wine and water. The respiration was freely carried on through the tube, and the quantity of mucus which collected in it was very small. It was carefully watched, and mopped out regularly.

Between 1 and 2 A.M. of the 31st, he again became very restless; mucus began to collect in the bronchial tubes; the pulse

became indistinct, and finally ceased at the wrist; the extremities became cold; he sunk gradually and quietly, and expired at 3.10 A.M.

At the examination of the body on the following day, the only parts minutely examined were the fauces and air-passages. They were coated extensively with a thick false membrane, which extended far down the trachea beyond the opening made in it.

It will now be necessary to allude to what occurred to myself in connection with Mr. MacNaghten's case. During the whole time of his illness, I was myself ailing a good deal, suffering principally from tendency to sore-throat, with general malaise; not to such an extent, however, as to prevent me carrying on my duties as usual. I was in this state at the time I performed tracheotomy, after which, as I have stated above, I was obliged at least twice to place my lips to the tube in the trachea and clear it by suction of the frothy mucus which was blocking it up, and which could not otherwise be removed. Six days after this, the general malaise and slight cynanche continuing in the meanwhile, I was suddenly seized with a very violent febrile attack, accompanied with very severe lumbar pains. The pulse was from 125 to 130; the skin hot; the tongue coated; the fauces swollen and inflamed, and here and there on the tonsils coated with the same kind of exudation as that which existed in Mr. MacNaghten's case. The febrile symptoms ran very high, and the inflammation of the throat ultimately took on an ulcerative character. The free application of the nitrate of silver, the use of hot baths, and the administration of antimonials and diaphoretics were the means successfully employed in my case.

Mr. Molloy, the assistant-surgeon, who had once put his lips to the tube, and who was in excellent health at the time, did not suffer any ill consequences from doing so.

No cases of diphtheria nor of scarlatina existed in Rio de Janeiro at this time, so far as I am aware.

IV.—*On Diphtheria in Bengal. By John Jackson, M.D., F.R.C.P., late of the Bengal Medical Staff.*

[Read before the Society, April 4th, 1859.]

In the year 1833, a lady and her two children arrived in Calcutta from the upper provinces. These children were suddenly attacked with disease in the throat, said to be of the nature of putrid sore-throat; and although the affection apparently was not particularly severe, they all sank under it with strange rapidity and most unexpectedly. They were supposed to have died from sore-throat, free from any great uneasiness in the throat, or difficulty of respiration or swallowing until the last. The children were playing together in the morning, and in the evening of the same day they were attacked with a suffocating cough, which was quickly

fatal. This I learned from the medical man who had attended them.

The first case that came under my own observation occurred some years afterwards, when I was asked to visit the child of a native living in the suburbs of Calcutta. It was late in the evening, and the father told me that he had hoped the child would get well without troubling me; but that, as the disease still continued, he was obliged to request my attendance. On entering the house, I heard the child's breathing, and the stridulous cough, which at once bespoke a disease of a croupy nature, and I remarked that I had no doubt an emetic at once, with an aperient in the morning, would set matters right; but when the father informed me that the child had been ill three days, I at once considered the case to be hopeless; and on going up stairs and examining the throat, I found the soft palate, the uvula, and tonsils covered with a firm exudation of plastic lymph of the thickness of kid leather and of the same colour. The child was breathing laboriously, and the countenance already indicated a want of oxygenation of the blood in the lungs. An emetic was administered, and produced slight relief, but without any removal or separation of the membrane. The child became speedily worse, and died after four hours from the time I was first called in. In Bengal it is most rare that attacks are fatal; the seizure is generally a spasmodic one, void of any inflammatory character, and an emetic, with a warm bath, and a brisk purgative after a few hours, is generally sufficient to remove the disease. It is very seldom that leeches or blisters are requisite, or that a calomel treatment is resorted to for the cure of this affection in Bengal, and the same may be said of the management of the disease in the midland provinces of India.

The disease in the above noted instance was very different from the ordinary form of croup. The exudation of the lymph on the tonsils, soft palate, and uvula, most probably passing down the air-passages, marked it as an affection of a peculiar and uncommon character. My own experience of croup amongst both natives and Europeans in India has not been limited, and I could therefore at once pronounce the disease in the case referred to to be an unusual affection. Within a few days after, I was requested, by a medical friend, to visit with him a child that had lately arrived from the upper provinces suffering from disease of the throat. Before the time fixed for my accompanying him, I received a notice that the child had died.

The third case brought under notice was that of a little boy, about six years of age, who had been suffering under this peculiar affection; and after undergoing moderate antiphlogistic treatment, with small doses of calomel, and being supposed to be convalescent, I was asked to visit him. Unfavourable symptoms returned after a few days, and the child died.

The next cases that occurred were at the Martinière School, and the medical attendant of that institution, Dr. Webb, informed me

that there had been several cases of diseased throat there, and that many were fatal, so much so as to cause an inquiry by the Governors into the nature of the complaint, and the causes of its occurrence; and at the recommendation of himself, to apply to the municipal authorities to have the ground cleared in front of the building, and to remove a range of extensive sheepfolds that for some years had been in existence, having been allowed to be erected immediately to the south of the building, in such a position that the south wind, the most prevailing one in the warm weather, appeared in the evening to be impregnated with the effluvia from these extensive sheepfolds, and the smell of them was experienced in the sleeping apartment of the children.

In the disease amongst these children, when fatal, the exudation of lymph covered the tonsils, and passed down the air-passages into the bronchial tubes as far as their minute ramifications. Several specimens of the disease were removed to the Medical College Museum, and were there carefully examined by the Professor of Anatomy with the microscope; and I would refer to Dr. Webb, who, no doubt, would be able to give the fullest details upon the subject. As far as I recollect, there were thirteen children attacked, and five died. The treatment was, I believe, chiefly antiphlogistic. All the above cases referred to happened amongst children, and the following one is the only instance brought to my notice amongst grown-up people, and this was the most distressing of any.

This patient was a lady, about twenty years of age, living in the healthiest locality in Calcutta. She had not been married long, and was advanced in pregnancy. I was requested by her medical attendant to visit her at four o'clock in the afternoon. She had been thought to be suffering from a sloughy state of the throat, and had been seen by another medical friend who had taken this view of the case. I found it, however, to be similar to the cases that I had before met with, and felt that there was no hope of her recovery. She walked from one room to the other to the window, that her throat might be examined. The throat was lined as if with a coating of melted wax. This covered the uvula, the tonsils, and passed down the air-passages. The uvula was so coated as to fill up the rima glottidis, and I was able to remove from it a portion with the forceps resembling the finger-end of a kid glove, only somewhat thicker, like "whet-leather." The mucous membrane below was not ulcerated, but had a reddish and inflamed appearance. The passage seemed to be rendered more free after the operation; but no benefit followed this or any other plan of treatment. Tracheotomy was not resorted to. Indeed, before my intended visit, after three hours, this poor lady was seized with suffocating convulsions and died.

She had had no long previous indisposition, nor did any alarm about her case appear to have arisen until the last day of her illness.

In none of these cases was there any rash upon the body, or any resemblance to scarlatina. The pharynx did not appear to be affected. The disease did not seem to be communicated from one to the other; for, at the Martinière, the same cause might be attributed as producing the disease in all who were affected by it; and I did not hear that any child, on returning home to its parents' house, communicated the disease to any other member of the family.

Though measles and small-pox are most frequent throughout India, and are occasionally of such virulence, at intervals of five years, as to prevail almost as an epidemic, yet the true scarlatina, with rash, sore throat, and the usual pathognomonic symptoms of that disease, has not been, on any occasion within my own observation and experience, communicated to another. A scarlet rash, especially on the palms of the hands and soles of the feet, with slight fever, in new-comers to India, is occasionally met with, and there is a resemblance to the disease; but the true character, in all its power of communicability from one person to another, has never been developed in any case that I have met with.

In the disease above alluded to, there was nothing of a typhoid form. The constitutional symptoms were slight in all the cases at the first appearance of the disease, and the local affection was the subject that first called for attention; and so great was the necessity felt for examining the throats of the children and applying a local remedy, that a solution of caustic (20 grains to the ounce) always found a place in my medicine-chest, and was applied freely on any suspicion. This was followed by an emetic, a mild aperient, and quinine; but I never had any case in which I could positively assert that the disease had been prevented, and my own experience only goes to show, that in every case that I was called upon to witness, it was a few hours only preparatory to the fatal termination. I always considered the disease as a severe and uncommon form of croup.

SUGGESTIONS FOR UTILISING THE STATISTICS OF DISEASE AMONG THE POOR.

By GAVIN MILROY, M.D., Fellow of the Royal College of Physicians, etc.

[*Read January 2nd*, 1860.]

AMONG the many subjects of moment connected with the administration of the Poor-law in this country, not the least important is the subject of the amount and results of sickness among the indigent classes, and of the agency by which medical relief is afforded them when suffering from actual illness.

The great extent and variety of the field of observation under systematic supervision at all times, as well as the immense number of the sick poor annually treated by able medical men resident among them, and who are required to keep a register of each case, suggest the idea that most valuable practical information respecting the public health might be easily obtained on a large scale, and of the most authentic kind. In no other country in the world do such facilities exist.

For the care of the 14,963 parishes and unions in England and Wales, there are upwards of 3,000 medical officers under the general superintendence of the Poor-law Board, at an annual cost of, I believe, a quarter of a million sterling. The entire number of paupers three months ago* was, in round figures, 850,000; of whom 111,500 were inmates of workhouses, and the rest receiving out-door relief, and, consequently, living in their own dwellings.

Supposing that there is little more than a single attack of illness in the course of a twelvemonth to each pauper—an estimate very much below the probable mark—we have at once an annual register of a million recorded cases of sickness among that very portion of the population, whose condition it is most important for the public welfare to ascertain.

But besides the poor who are receiving pauper relief, a large proportion of the poorer labouring classes are in sickness treated by the parochial medical officers. What the average annual number of the latter may be, I am unable to say. Probably it is little short of a million, taking one year with another.

Hitherto, the immense mass of information in the returns and reports of the medical officers on the statistics of disease among the poor has not been explored, or turned to any use-

* This paper was written at the beginning of the year 1858, and submitted at the time to the Poor-Law Board.

ful account; nor can it be, until some means be adopted to ascertain and arrange the more important facts contained in the separate medical returns of each parish or district.

At present, there is no possibility of determining, with any accuracy, what are the most frequent disabling diseases among the poor and labouring classes in our towns, villages, and rural districts; nor whether these diseases vary much in frequency and severity in different parts of the country; nor the influences of age, sex, condition, and employment on their production.

And yet is very necessary that all these particulars be known before we can appreciate and estimate aright the principal predisponent and exciting causes of diseases, with a view to their abatement or prevention.

The data for much valuable information upon these points exist in the returns and reports of the parochial medical officers; but these documents are unseen except by the local boards of guardians; nor is any further use made of them.

That a very large proportion of the sickness among the poor might be easily and inexpensively prevented by simple hygienic measures is clearly deducible from the returns of the Registrar-General. These returns, however, indicate only the fatal results of disease, and give a very imperfect idea of the amount of suffering and wretchedness which such disease occasions.*

To take one instance: on the average, 16,000 persons die every year from continued fever in England and Wales. This number of *deaths* represents, there is good reason to believe, an aggregate of little short of 200,000 cases of a disease which experience has proved to be so much under preventive control that, now-a-days, it is rarely met with in the very places which formerly gave it its common names of "jail-distemper" and "ship-fever." It is a disease, too, which specially attacks the classes from which most of our paupers come, and is invariably of slow recovery, and extremely apt to leave other maladies in its train. Its principal victims, moreover, are the middle-aged of both sexes, the parents usually of young families. We cannot, therefore, be surprised on finding that so many of the children in our workhouses are the offspring of persons who have died from an attack of fever, or who, if they recovered, were reduced to beggary in consequence.

Again, there is at all times an enormous excess of mortality among young children in the dwellings of the poor—a mortality which is often so great that half of all the deaths in a

* In 1858, 5,535 persons died in the metropolitan workhouses—nearly one in eleven of the whole deaths in the metropolis. "The death of so many persons in the large workhouses demands inquiry."—*Weekly Returns of the Registrar-General.*

locality take place under five years of age. This waste of early human life is mainly owing to the fact of the different eruptive fevers, and of the diseases of the bowels and lungs, etc., being aggravated fourfold in fatal severity by domestic and other causes of insalubrity, most of which might be easily diminished, and not unfrequently be altogether removed.

The case of small-pox stands by itself. It is the subject of special legislation, and demands special consideration among the diseases which are so destructive of life among the poorer classes. Thousands of the poor annually fall victims to a distemper against which we have an all but infallible preservative, the indifference or prejudices of ignorance among the people being the chief obstacles to its universal adoption.

If we take the total annual mortality from all causes in England and Wales, it is stated, on the high authority of the Registrar-General, that between fifty and sixty thousand deaths at least every year may be regarded as premature and avoidable. The great bulk of these unnecessary deaths occurs, of course, among the poorer classes.

It has been calculated that, upon the general aggregate of diseases, there are between twenty and thirty cases of sickness for every death. At the very lowest estimate, it would thus appear that there is more than a million of attacks of illness in the course of a twelvemonth which might be avoided by greater attention to the hygiene of the poor.

With such a state of things before our eyes, we cannot wonder at the ascertained results of inquiry, that three-fourths of all the actual paupers in the country have been made paupers, directly or indirectly, by disease.

Whatever will diminish the amount of sickness and death among the working classes, must serve to diminish the amount of expenses chargeable upon the parochial rates, and *vice versa*.* That the first of these desirable events is within our reach admits of no doubt; for wheresoever the bad state of the dwellings of the poor—and this is but one out of several hygienic evils—has been even partially improved, sickness has rapidly decreased. The well-known results of the Common Lodging House Act afford incontestable evidence on this head.

It is scarcely possible to over-estimate the benefits to the whole community which would accrue from the attention of parochial boards and other local authorities, as well as of resident influential individuals, being constantly kept drawn

* The cholera visitation in 1853 left a permanent annual charge of between two and three thousand pounds upon the rates in Newcastle for the support of widows and orphans, independently of a very large expenditure for the immediate relief of the sufferers during that epidemic.

to the consequences of the neglect of the hygienic condition of the poor; and in no way could this be so easily or effectually done as through the medium of the labours of the medical officers who attend upon them in sickness; for none know so well as these gentlemen the evils which sap the health of the labourer, and which so often issue in pauperism and mendicancy.

The plan adopted in one department of the public service with success may be fairly presumed to be applicable to another. Five-and-twenty years ago, no use was made, at least to any extent, of the constantly-accumulating experience of the medical officers of our Army and Navy in reference to the average annual amount of sickness, mortality, and disablement among our soldiers and sailors. It had been long surmised that, at all times and in all climates, this amount was high—higher a good deal than it was thought that it should be. It was known, too, that every now and then the losses from epidemic disease were excessive in barracks and on board ships of war. Still, no measures for the general improvement of the health of the men could be satisfactorily devised until all the facts bearing on the subject, and contained in the returns and reports of the medical officers, were examined and sifted. This was at length done, and the work has been ever since systematically carried out,—and with the best results in the way of making known the defective arrangements which told injuriously upon health, and of leading to various improvements which have had the effect of materially reducing the proportion of sickness and mortality among the men. The statistical returns of the Army and Navy medical departments have afforded the groundwork and authorisation for most of the salutary changes which have been already effected, or which still remain to be effected, in both services.

Were something of the same sort done with the mass of instructive details contained in the returns and reports of the parochial medical officers, equally beneficent results would, I am convinced, ensue—more slowly and gradually, it is true, but in the long run not less decisively—to the poorer classes of our country, who suffer a disproportionate amount of sickness and death from circumstances not inevitable or inseparable from mere poverty, but which are superadded to it either from ignorance or neglect, or from causes over which they themselves have no control, however capable the evils may be of correction or removal.

An annual report, founded upon an examination of these documents, and embodying their leading facts and general results, could not fail, in conjunction with the admirable yearly reports of the Registrar-General, to prove of the highest value to the science of public hygiene and topographical medicine.

It would, moreover, be directly and immediately useful, in various ways. The labours of local boards and individuals would be aided and guided by the authentic information thereby made accessible, and the results of these labours would become generally known. The good example of one place would stimulate imitation in another; means and appliances found useful here would be copied elsewhere; and thus local experience would be made profitable to all.

Besides the duty of preparing such an annual report as that now indicated, the services of a medical officer attached to the Poor-law Board would be of public utility in various other ways.

Many of the workhouses in different parts of the country are faulty in their constructive and other arrangements, outside as well as inside the buildings. The occasional severe outbreaks of disease, or its persistent continuance among the inmates, especially among the children, afford proof of this. Much might probably be done to prevent the recurrence of such casualties, if reference could be always made to a skilled officer whose attention was specially drawn to the consideration of all questions of hygiene affecting masses of persons congregated within a limited space.

His opinion might serve to aid the inspectors of the Board, and also the parochial medical officer, in recommending for adoption by the guardians such changes in diet, clothing, exercise, etc., as might be advisable for the better preservation of the health of the inmates. The experience of an officer acquainted with the condition of all the workhouses throughout the kingdom could scarcely fail to be both acceptable and useful to the local authorities, as well as to the central Board. On the threatened advent of an epidemic disease, and other like occasions, the advice of a medical officer who was in direct connexion with the Poor-law Board, co-operating with the resident medical attendants, would often be productive of good in warding off the attack, or greatly mitigating its violence.

The frequent opportunities I had, during my connection with the General Board of Health from 1849 to 1855, of direct intercourse with parochial surgeons and boards of guardians, often in company with the Inspectors of the Poor-law Board, warrant me in making these statements.

Many most beneficial improvements in the condition of the workhouses throughout the kingdom have been effected by the Poor-law Board; and it seems but reasonable to believe that the legitimate influence of the Board, guided by the ascertained results of the experience of the parochial medical officers, might be brought to bear with excellent fruits, through the

medium of such an annual report as has been suggested above, upon the many sanitary evils affecting the out-door poor and the poorer working classes generally, and which lie at the root of so much of the pauperism of the country.

The statistical materials for the report could, of course, only be obtained by securing the willing co-operation of the medical officers throughout the kingdom. To require the information from these gentlemen without adequate compensation at the same time, is wholly out of the question; and, on the other hand, I much fear that if nothing is attempted until boards of guardians can be induced to be more just and liberal in remunerating professional services, the proposal for any useful registration of disease among the indigent classes is hopeless. But it will not be from the medical officers that the chief obstacle to the project being entertained is to be looked for. They have always shown themselves among the most active promoters of every scheme for improving the social condition of the poor, and for advancing the best and highest aims of the healing art. If it were as easy to overcome official inertia, and the unwillingness of governmental departments to introduce any change in established procedure, as it would be to enlist the sympathy and assistance of the parochial medical men to the measure proposed, the prospect of something being done would probably not be very remote. The Poor-law Board has but to request their co-operation, and that co-operation would, I believe, be very generally accorded. The sanitary inquiries instituted seventeen or eighteen years ago at the instance of the Board, and which issued in the accumulation of so much important information (digested and systematised in Mr. Chadwick's admirable report of 1842) respecting the domiciliary and general condition of the working and necessitous classes, owed most of their value to the evidence of parochial medical officers in different parts of the kingdom.

Of course, the more simple any scheme for the registration of diseases is, the more likely it is to be adopted and acted upon. It has occurred to me that a form of *monthly* return, on the plan of the one here appended, would at first suffice for the purpose, and be as little onerous, in respect both of time and labour required to fill it up, as possible. The great object is to receive exact and regular information on a few points from a number of different localities, so that the data thus obtained may be collated and compared. It has been by following out this plan in meteorological and other branches of physical research that, of recent years, some most interesting and highly valuable discoveries have been made.

Parish or Union of *Population in* 1851. *Males* ; *Females*

1859. JANUARY. No. of Cases remaining from last month. Males.	Females.	MONTHLY RETURN OF SICKNESS AND MORTALITY AMONG *OUTDOOR** PAUPERS, ETC. 60—80 years.	40—60 "	20—40 "	5—20 "	Under 5 "	No. of New Cases. Males.	Females.	DISEASES.	Deaths Total. Males.	Females.	Under 5 years.	5—20 "	20—40 "	40—60 "	60—80 "	REMARKS ILLUSTRATIVE OF 1. Locality. 2. Dwelling. 3. Occupation. 4. Food, Drink, etc.
									Continued Fever.								
									Ague, etc.								
									Scarlatina.								
									Measles.								
									Hooping cough.								
									Small-pox.								
									Diarrhœa.								
									Cholera.								
									Diphtheria.								
									Other Zymotic Diseases.								
									Scrofulous Diseases.								
									Phthisis.								
									Other Constitutional Diseases.								
									Diseases of the Nervous system.								
									" " Respiratory ditto.								
									" " Digestive ditto.								
									" " Uterine ditto.								
									Other Local Diseases.								
									Abortion								
									Teething, etc.								
									Atrophy.								
									Other Developmental Diseases.								
									Accidents.								
									Poisoning.								
									Other Violent, etc., Deaths.								
							490	500		21	17						
							990										
217		-	-	-	-		217										
		Total Sickness					1117			38		Total Deaths.					

* A similar monthly return for the in-door or workhouse paupers would be required.

REMARKS ON THE TOPOGRAPHY AND DISEASES OF THE GOLD COAST;

WEST COAST OF AFRICA.

By R. CLARKE, Esq., late Surgeon to the Natives.

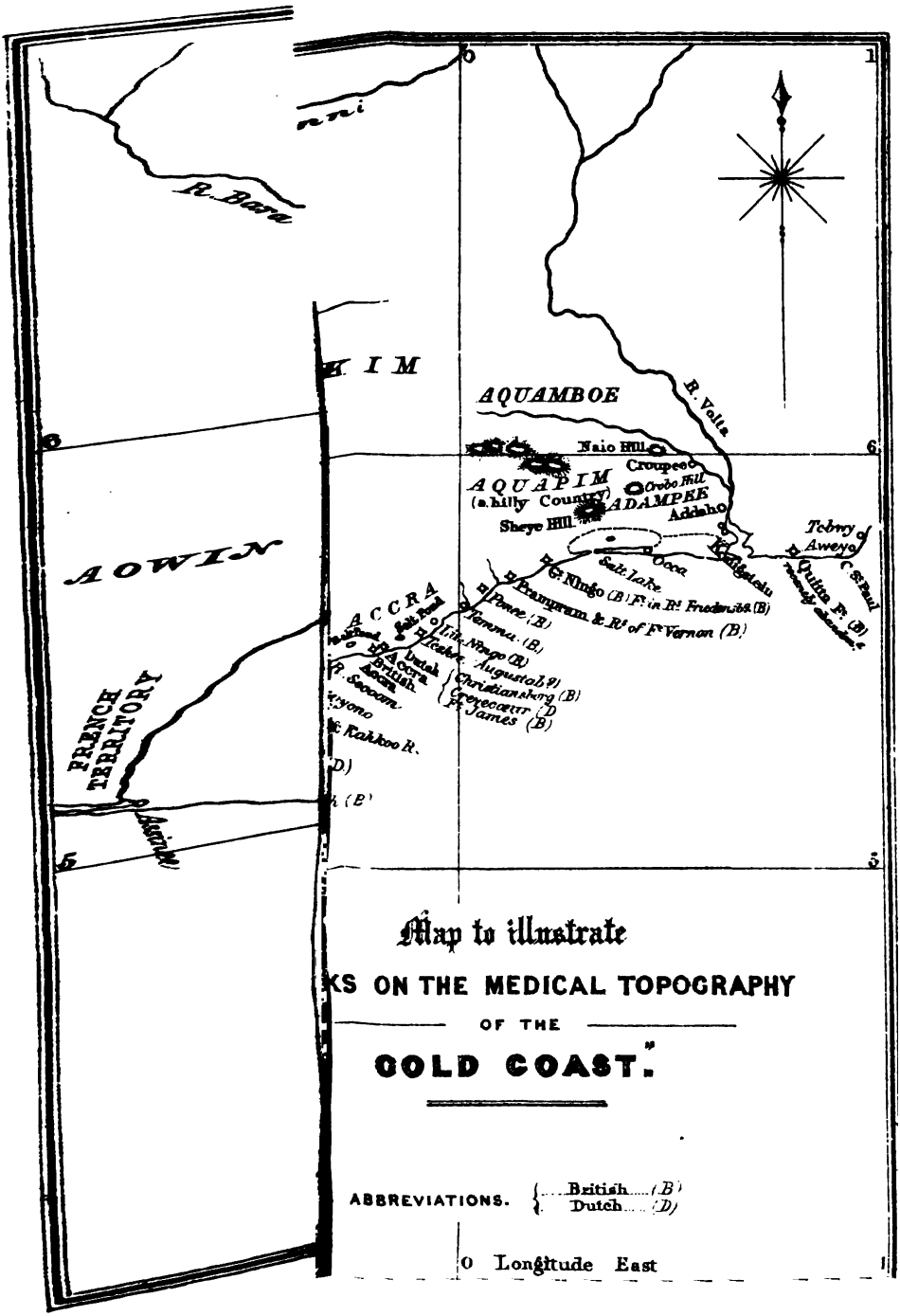
[*Read Monday, May 7th*, 1860.]

BEFORE entering upon the immediate subject of this paper, I shall endeavour to give an outline of the general divisions of the Gold Coast, and the races inhabiting it. The Gold Coast is divided into the two great divisions of the Leeward or Eastern Districts, and the Windward or Western Districts; the Secoom, a small river, some eight miles from Accra, being the boundary line between them.

The British forts and villages along the seaboard are situated at irregular distances, from Cape Appollonia on the west, to the river Volta on the east, an extent of about two hundred and forty miles, and lying between 4° 40′ and 5° 40′ of north latitude, and from the meridian to about 3° of west longitude. Addah, Quitta Fort (lately abandoned), Ningo, Pram Pram, Pony, Temma, Teshi, Labadee, Christianborgh Castle, and James Fort, British Accra, are within the former or Leeward division; while Appollonia, Dixcove Fort, British Secundee, and Commendah, Cape Coast Castle, Animaboo Fort, Coromantine, Mumford, Tantunquerry, and Winnebah, are included in the latter or Windward division. Besides these towns and larger villages, there are numerous hamlets along this line of sea coast, which it is here unnecessary to note.

But, from the fact of the forts and stations belonging to the British and Dutch governments closely intersecting each other at short distances between Appollonia and Accra, great and almost insurmountable difficulties are constantly arising between the two governments. At Accra their proximity is strikingly illustrated, British Accra being only separated from Dutch Accra by an imaginary line; the people of these towns being, moreover, bound together by the ties of blood, language, laws, customs, and government.

The Dutch manage their possessions upon the Gold Coast with great economy; the annual cost to the mother country being a trifle compared with the amount, £24,000 or £30,000 annually, disbursed by England to maintain its government in



R. Bara
AQUAMBOE
R. Volta
Naio Hill
Croupee
AQUAPIM
(a hilly Country)
Crobo Hill
ADAMPEE
Addah
Sheye Hill
Tebwy
Awey
Salt Lake
Ocoa
Kinnigstein
Quitta Ft. (B)
C. St. Paul
Gt. Ningo (B) Ft. in Rt. Friedensbg. (B)
Prampram & Rs. of Ft. Vernon (B)
Ponee (B)
Tamma (B)
Lit. Ningo (B)
Teshee
Augustab (?)
Christiansborg (B)
Crevecœur (D)
Ft. James (B)
ACCRA
Salt Pond
Dutch
Accra
British
Accra
R. Secoom
Kakkoo R.
AOWIN
FRENCH TERRITORY
Assinee
0
1
6
5
Map to illustrate
KS ON THE MEDICAL TOPOGRAPHY
OF THE
GOLD COAST."
ABBREVIATIONS.
British (B)
Dutch (D)
0 Longitude East

that part of the world. This they are enabled to do from the territories of both nations being so closely interlaced, that the presence of our troops, and squadron cruising upon the coast, exerts a moral influence so powerful, that it is sensibly felt and alike acknowledged by the subjects of both countries. Therefore a militia force of one hundred well disciplined and armed men, clothed in a uniform made of the cheap fabric called 'blue baft', commanded and drilled by two military officers, assisted as circumstances may require by the gentlemen of the civil department, is found by the Dutch sufficient to support their authority, and to repress revolt.

With few exceptions, nearly all the people of the protected territory may fairly be set down as consisting of two races, differing from each other not only in language, but in many of their customs and laws. Within the protected territory, the Oji is spoken by the Fantees on the coast, and by the Assins, Wassaws, Dinkerras, and others in the interior. In the Leeward districts it is not the language of the coast towns; but it is spoken by the Akims, Aquamboes, and Aquapims in the interior. The purest type of the Oji is the Ashantee, the Fanti differing greatly from it. The Akims, Assins, and Aquamboos speak almost pure Ashanti; nevertheless, they, with the Fantees, understand each other. Not a very long time ago, these tribes were subject to the King of Ashantee, and their territory was part of his kingdom. The Accra language is chiefly spoken by the Accras of Jamestown, Dutch Accra, and the people inhabiting the adjoining country; but the Croboes, who occupy the inland region about sixty miles from Accra, speak a dialect of Accra known as the Adempi tongue.

COURSE OF THE SEASONS.—The seasons of the Gold Coast, as in all other tropical climates, may be divided into wet and dry. There are, however, two rainy seasons in the year; one begins about the end of May, and diminishes in September, when there is generally an interval until the end of October; but this last hardly merits the name of a wet season compared with the quantity of rain which falls in the former period. Towards the end of July, the heavy rains are considered at an end, and shortly after, the fogs or "smokes" set in. This is by far the most unhealthy period of the year. The fogs continue for several weeks, but are generally over about the 14th or 18th of August. The dry season sets in in November, and continues, with trifling variations, throughout the remainder of the year, and until the following month of May. Tornadoes commence in March, and continue about two months. About the middle or end of December, the Harmattan winds blow, a

haze accompanying it. It blows at any hour of the day, time of the tide, or period of the moon. On the Gold Coast, this wind blows from the North-east, or from the E.N.E., and generally prevails in December, January, and February. The sun is obscured the greater part of the day, and is often only visible for a few hours about mid-day, when it appears of a deep red, causing no unpleasant sensations in the eye. The moon, which shines so brilliantly in this climate, is also obscured, and few stars can be distinctly seen. The eyes, nostrils, lips, and palate become dry, and uneasy; and when the Harmattan continues four or five days, the outer cuticle often peels off from the hands and face, and should it prevail longer, other portions of the skin are similarly affected. It exposes defects in furniture, and contracts wooden flooring so much that light is freely admitted through the seams, and sounds from above or below may be heard with greater distinctness. Neither dew nor moisture can be detected. The country at this season of the year has a wintry aspect, and the aridity of the soil is so great that the earth splits and cracks open, and when walked upon conveys the ringing sound so perceptible in clear frosty weather. The branches of the orange and lime trees droop, and the leaves become flaccid and wither. The grass is dry, withered, and brittle, and the natives take this opportunity to set it and the jungle on fire. Water is rendered deliciously cool—so cold, indeed, that in some persons it causes a momentary aching in the teeth. The climate of the Gold Coast may, however, in my opinion, be favourably contrasted with that of Sierra Leone in several vital points. In the former, the type of the remittent fever of the country is generally mild, of short duration, and rarely proves fatal to European life; in the latter, on the contrary, the seasoning fevers are prolonged, intractable, and too often terminate in death. Then, again, the epidemic, or yellow fever, which at uncertain intervals, scourges the colonies of Sierra Leone and the Gambia, is wholly unknown on this coast. The atmosphere of the Gold Coast is, moreover, drier; the alternations of temperature neither so great nor sudden; and the electrical balance, if I may so express myself, is less liable to sudden disturbance. The mean fall of rain at the usual season is very much less than at Sierra Leone. The quantity of rain which falls during the year, it has been stated, averages from eighty to a hundred inches. The nights during the rains are cool and pleasant; but the natives, at this season of the year, suffer a good deal from catarrhs, pulmonary, and rheumatic affections. During part of the rains, thick fogs prevail, and this dense vapour renders the atmosphere hazy,

descending in the evening in the form of a dew, so heavy that it penetrates the wooden flooring to such an extent that the boards look as if just washed, and it hangs upon the jalousies of the inner doors of the house like great rain-drops. The fogs on the Gold Coast, and on the coast generally, are called "smokes." More rain falls on an average in the interior of the country than on the seaboard; and this, in my opinion, does not arise from the land in the interior being more elevated than on the sea-coast, but it appears to depend upon the large tracts of land covered with lofty trees attracting and arresting the clouds surcharged with moisture; for in the vicinity of the sea-coast towns, the large trees having been cut down, there is merely copsewood, densely matted by climbing plants —a circumstance which undoubtedly has greatly contributed to make these towns much more unhealthy than they would otherwise be had the forest trees in their neighbourhood been judiciously thinned, and not indiscriminately cleared away; for trees, it is well known, exercise a most salutary influence on the health of the inhabitants of malarious countries by screening off, and greatly modifying, that most subtle poison. The felling of the trees has likewise had the bad effect of greatly increasing the price of firewood in the coast towns, which indirectly injures the health of the poorer classes by preventing them from easily obtaining supplies of fuel for warmth and cooking purposes.

The seasons are well defined; the wet weather rarely encroaches on the boundaries of the dry, and the average variation of the temperature is 68° and 87° Fahrenheit between the coldest time of the night and the hottest time of the day. The Harmattan winds, so far from being injurious to life, are, in my opinion, very salubrious, and are much enjoyed by many Europeans who have lived long on the coast, as they find these winds very bracing; but persons recently arrived, on the contrary, generally find that they cause a dryness of the skin, and corresponding temporary functional disturbance of the liver. I observed that its effects were most beneficially felt by persons who had previously been suffering from dysentery, remittent or intermittent fevers, and that they then more quickly recovered. The heat of the climate on the Gold Coast is sensibly moderated by the sea-breezes, which blow at all seasons; and the heat is less oppressive and less felt than at Sierra Leone, where it is checked by the land-locked, mountainous amphitheatres which border its shores and rivers; but the filth of the coast towns, the badness of the water, sameness of food, and proximity of the forts to the sea, are evident causes of its

apparent unhealthiness. The interior of many parts of the country, especially about Crobo, Pram Pram, the Abrah country, and elsewhere, are far more healthy than the seaboard, and more conducive to European life. Fortunately, annoyance from that pest of other tropical regions, mosquitoes, is little experienced—a matter of no small consequence to the European residents on the Gold Coast.

The winds blow with regularity and mildness; the land-winds, which blow from the north and N.N.W., and the sea-breeze, which blows from the S.W. and W.S.W., prevail, with slight interruption, throughout the year. The sea-breeze commences about nine or ten in the morning, declining about six in the evening; it ceases about eight or ten, when it is succeeded by the land-wind, which blows until six or eight in the morning. The sea-breeze, at the full and change of the moon, blows with greater force, and it is at all times stronger than the land-wind. The sea-breeze is very refreshing; but the salubrity of the land-wind depends on the condition of the country over which it blows; for it becomes vitiated when it blows over jungles and swampy lands, but otherwise it is health-giving.

I may here observe that I have remarked that men advanced in life, and who had never been before in tropical climates, have a far better chance of living upon the Gold Coast, everything else being in other respects equal, than at Sierra Leone or the Gambia. Aged Europeans settling at either of these colonies incur an enormous risk. On the Gold Coast, they, on the contrary, generally enjoy good health, and are able to perform their several duties efficiently.

The Gold Coast has no navigable rivers of easy access with the interior of the country; and this circumstance, combined with the terrific surf which washes its shores, are causes which hitherto have greatly retarded its civilization. But, although the rivers upon the Gold Coast are unapproachable from the sea, on account of shifting sand banks, shoaling of the water, and bars at their mouths, they are nevertheless capable of carrying on an extensive inland navigation with the greatest benefit to the people. The rivers upon the Windward coast, westward of Cape Palmas, flow from the eastward; whereas those on the Gold Coast flow from the northward, or nearly at right angles. The principal river in the Leeward district is the Volta, which is about a mile in breadth, and runs nearly north-west and south-east, separating the Aquapim from the Aquamboe country, and is supposed to be a branch of the river Tando or Prah, which is crossed by the Ashantees on their way to the coast. The surf at the entrance of the Volta renders it

exceedingly dangerous and difficult for small vessels, boats, or canoes to enter it—a difficulty which is greatly increased during the rains. It is navigable for small craft nearly to Aquamboe; about a hundred miles distant from the sea, further ingress becoming impossible, even, for small canoes, in consequence of rocks and small cataracts obstructing and barring up its channel. The largest river in the Windward division is the Bossim Prah, which empties itself at the village of Chumah. Its banks are clothed with magnificent timber trees, and the river flows through fertile plains; but its entrance is obstructed by rocks and sand banks. It is a branch of the river Prah, the natural boundary which separates the protectorate from the kingdom of Ashantee. The Chumahs have added the word Bossim, to signify that the river is sacred or Fetish. The Iensuh river, near Winnebah, is likewise a large and important stream, having numerous branches, traversing the Agoona district, and penetrating far into the Akim country. Several of the rivers, as the Berrim and Sweet rivers, become small streams as they enter the sea. The Amissah, to the east of Anamaboe, is unapproachable from the sea; while the Naqua, further east, terminates in a *cul de sac* at a village of the same name.

I now beg briefly to describe Cape Coast Castle, the chief seat of the British government on the Gold Coast. It is situated in lat. 5° 6′ north, and long. 1° 5′ west. It was built by the Portuguese in 1612, but was seized by the Dutch some years after, and they held it until 1672, when the English took possession of it, and have held it ever since. The fortress stands upon a rocky promontory, some eighteen or twenty feet above the level of the sea, the reef jutting a considerable distance into it, and opposing an admirable breastwork to its inroads towards the south and west. In stormy weather the southern front of the castle sustains the enormous force of the heavy rollers which are dashed against it, the sea striking the rocks and batteries with so much force that the spray is swept over the latter, and even up to the mess-room windows, some forty feet above the level of the ocean. The noise of the billows, as they advance with amazing velocity to the shore, is deafening, and when they strike the rocks the shock is sensibly felt throughout the castle buildings.

The rock upon which the castle stands is composed chiefly of a very hard reddish grey gneiss micaceous slate, patches of feldspar, granite and quartz cropping out over its surface, as if forced upwards while in a state of fusion. The castle may be described as an irregular four-sided building with bastions at

each angle, having mounted on its batteries sixty or seventy pieces of ordnance. An imposing range of buildings three stories high extends from the north to the south angle, dividing the fort into two unequal parts. In front of these buildings there is a large triangular space, used as a parade and drilling ground for the troops, which is also the last resting place of the poetess L. E. L., and her husband, Governor McLean. In a smaller triangular area behind them, and which is commonly called the spur battery, some of the troops are lodged in casemates on its south side, those on its north side being used as quartermaster's, ordnance, and officers' stores, its centre being occupied by a guard-room built over one of the best tanks in the garrison. The accommodation, however, is altogether too limited, the civil and military officers being cramped for room, the troops being occasionally subject to dangerous overcrowding. Since its resumption by the government, several of the castle buildings have been enlarged; but there is still a wide field for further improvement. Orders have, I am, however, glad to state, been lately issued to convert the chapel, situated in the upper wing of the northern buildings, into officers' quarters, as strongly recommended by the commissioners, in their sanitary report, under date 30th June, 1857. The suite of apartments on the upper story of the central building, occupied by the governor, and likewise the officers' quarters, in the northern wing of the castle, are well situated and healthy. The garrison hospital is situated on the basement of the northern wing of the castle, and is tolerably well ventilated, lighted, and paved. The dungeons of the castle are revolting records of the purposes for which the fortress was originally designed. It was in these dismal recesses that the slaves were immured until they could be conveniently shipped off. They are under the south or sea battery, and access to them is obtained through a winding archway which opens into crypts formed by the divisional supporting walls of the battery, being feebly lighted and ventilated through grated apertures in the sea wall, which reeks with dankness from the percolation of water. The air is close and offensive.

In the vicinity of Cape Coast, a low undulating hilly range encloses it in an amphitheatre of irregular form; the chain of hills, sweeping in a convex semicircle, takes a north-east and westerly direction to within a quarter of a mile to the east, and about a mile to the west of the castle. Beyond the hills, near the sea, are valleys of inconsiderable extent; their highest peaks do not exceed three hundred feet in height above the level of the sea, while their average height is about a hundred and seventy feet. Their peaks and declivities are densely

covered with copsewood interspersed with a few cocoa-nut trees, the elais Guineaensis, fan and date palms, with forest trees. In the lower grounds cleared patches occur, sparsely covered with a grassy sward, and dotted over with clumps of trees; but the land under cultivation bears so very small a proportion to that lying waste, which prevails to such an extent, that the former is the exception, and the latter the rule. The bush has, however, been cleared away in different places in the suburbs by industrious persons, chiefly pensioners from the West India regiments, and these spots appear to much advantage when contrasted with the wilderness of jungle left in its primitive unproductiveness.

About a mile from the castle, and to the north-west of it, there is a salt lake upwards of a mile in length, and half that distance in breadth. It is below the level of the ocean, from which it is separated by a belt of sand, and is filled with water intensely salt, which percolates from the sea through the intervening mound of sand. In the rainy season, the water falling upon the hills which surround it is drained into the pond, and its volume is still further increased by springs which rise through the spongy reed covered morass at its extremity. When the rains are at their height, the area of the loch is greatly extended, portions of the adjoining land being regularly flooded at that season. There are similar salt ponds in the immediate vicinity of Animaboo, Jamestown Accra, and Christianborgh Castle, from which the people obtain supplies of crab and other fish.

As regards health, the removal of the jungle, and the tillage of the waste lands in the neighbourhood of Cape Coast, would free it from a perpetual source of febrile and dysenteric diseases, which at all times more or less afflict its inhabitants.

The soil differs in different localities. In some places it is siliceous, or composed of a black and fertile loam; while in other situations it is argillaceous, and of a reddish brown colour, through which quartz, mica, and feldspar crop out. A dark hard baked clay is abundantly met with, which is intimately blended with minute spangles of mica, and which is broken up with difficulty and labour. Many of the clays are made into pots, and are in common use throughout the settlements for cooking purposes, for which they are exceedingly well adapted. Very good bricks are also made from them.

In several parts of the country, as Akim, Dinkera, Tueful, and Wassaw, gold-digging is the occupation of large numbers of people, who resort thither from all parts of the settlements. All day and night, nothing is heard but the noise of digging,

grinding, and washing the soil. The pits, at their entrance, are generally two feet in diameter, and vary from forty to fifty feet in depth, according to the distance of the auriferous quartz from the surface. The earth is removed with a clay pot, attached to a rope, and in this way the hole is deepened, and made large enough to admit of one man working in a squatting position. The excavated earth is divided between the men who work the pit, carry it home, and grind and wash it. The chief of the district is entitled to one-third of the proceeds. From these pits being frequently shored up very imperfectly, and often not at all, masses of earth fall in, burying the miners alive. Apintoe and Essaham are the principal gold fields in Western Wassaw. At the diggings, marketable goods, such as cotton, rum, gunpowder, etc., are sold at greatly enhanced prices, from the difficulty of their transport, in exchange for gold dust. The yield varies greatly. The metal is procured at some of the "holes" from the auriferous soil, and at others from the crushed quartz. In other districts, it is obtained by washing in the beds of rivers and watercourses after the rains have run off, especially at the base of the hills. At Cape Coast, and along the seaboard, women may be observed washing the sand on the beach, especially after heavy rains. The sweepings of the market-floors are also diligently swept up and washed to recover any gold dust dropped during the day. They carry the earth to the seaside, and, putting it into a wooden bowl, pour upon and mix with it a quantity of salt water. The bowl is then rapidly moved in the hands, with a circular motion, until the lighter particles are washed off, when the weightier portion of the earth is placed in another bowl. The operation is repeated until a bowlfull of the earth is freed of its lighter parts, when a careful examination is made, accompanied with frequent washings, the gold being at length found deposited in the bottom of the vessel, where it is allowed to remain until the whole of the earth is washed away. It is then removed, and dried by the sun or fire. The earnings of these poor women average about 10*d.* sterling daily, but occasionally 2*s.* 6*d.* worth of granular gold rewards their severe toil. To the granules collected on the beach, a fine, black, and apparently metallic, sand is often found adhering. The bulk of the gold exported from this part of the coast comes from Ashantee, and the quantity annually sent to England is estimated at 100,000 ounces. Nothing is at present known of the other metallic and mineral resources of this country; and the discovery of valuable metals in its soil besides gold, remains to incite and reward the labours of

future investigators. At present, palm oil is the staple article of export, and the trade in it is yearly increasing. Ivory, Guinea grains, and copal are also largely exported. Timber trees abound, well suited for ship building and for furniture. Beams of the cocoa-nut tree are in common use, and are valuable, as they resist the white ant. The soil is admirably adapted for cotton and coffee; and I feel satisfied that hereafter both articles will be extensively cultivated, and are destined to become important exports from the Gold Coast.

Having travelled through several parts of the country, I beg to record my impressions; and, first, I would observe the remarkable difference which exists in the general features of the windward and leeward divisions of the Gold Coast, in that by far the greater extent of the former is either clothed with wood or jungle, whereas tracts of the latter (which, however, includes a part of the Winnebah or Agoonah district in the windward division) consists of vast plains, beautifully interspersed with trees and shrubs, and carpetted with grass, and adorned with a variety of flowers. Indeed, the country about Winnebah cannot be exceeded in beauty or variety, presenting the most perfect resemblance to a domain laid out with the utmost art, the elegant clumps of trees which adorn it giving a park-like appearance to the surrounding country. The country about Accra, Christianborgh Castle, and especially extending northward of Pram Pram, and Ningo, is pastoral and luxuriant to a high degree. The air in this open and champaign country is likewise cooler and more invigorating to Europeans than in the windward division, which is extensively wooded. Game is also abundant—hares, deer, antelopes, quail, partridge, bustard, and guinea-fowl stocking it in great numbers. The windward division, on the contrary, is covered to a great extent with tracts of magnificent forest trees and copse, rendered impenetrable by masses of underwood and plants with prickles which grow between the trees and interlace them together. Lianas coil around and festoon many of the trees, frequently crossing one another like network, winding themselves in all directions. These fibrous plants vary in thickness from a thin cord to that of a cable; climbing to the summits of the trees, they stretch to those adjacent, or depending from them swing idly in the wind, the tortuous pathway being alone trodden by the foot of man. Even the charming glades which open up the forests at several points, relieving and delighting the eye, tired of the wearisome sameness of the route, are uninhabited; but many of the villages and hamlets in the rural districts are built in the midst of the forests, sufficient land being cultivated around them to meet the wants of the people. A great differ-

ence is, however, perceptible as to the extent of land cleared and under cultivation in the different parts of the Gold Coast, more land being left fallow some years than in others, when the natives are stimulated to labour by the prospect of a market for their produce; otherwise they, in general, do not care to plant more than is necessary for their wants.

From the opportunities I had of judging, I am led to conclude that the protected territory is sparsely inhabited. Its population has been estimated at 400,000, scattered over a surface of about 8,000 square miles. The people have no manufactures worthy of the name, but may be separated into three classes—agriculturists, traders, and fishermen. Narrow cotton cloths are woven in some districts, and baskets and mats are ingeniously made in others, while they greatly excel in gold work, fashioning elegant and beautifully-designed ornaments of that metal. There are, however, several places along the seaboard where salt is prepared from sea water by natural evaporation in shallow pans; but they likewise obtain it with less trouble by scraping it off as it is formed upon the surface left dry by the evaporation of the water in the salt ponds. Brick-making is also carried on at Cape Coast and Annimaboo. The population has not been diminished by war, pestilence, or famine, for the Croboe revolt last year (1858) may be said to have been put down without bloodshed; nevertheless, the increase of population has not been in any degree commensurate with what might reasonably be expected under such favourable circumstances. To what, then, is the cause ascribable? In my opinion, the chief cause arises from the enormous mortality which continually occurs in infancy from mismanagement by the natives of their young, and by their unskilful medical treatment. Polygamy is another cause which powerfully contributes to this effect, because the habits which it engenders materially diminish the number of births; and, undoubtedly, the easy access to spirits, and its enormous consumption in these settlements, may justly be considered extremely prejudicial to life.

The sanitary condition of the town of Cape Coast, and indeed of all the towns upon the seaboard, is deplorable; notwithstanding that some good has of late been effected by the municipality, yet, strange to relate, no public cloacinæ have as yet been provided to meet the wants of the people, although the subject has been repeatedly taken up, and just as suddenly dropped—the consequence being that decency is constantly outraged, and the most disgusting nuisances are openly committed in the streets. Foul stenches everywhere assail the

nose and corrupt the air, dunghills being attached to the huts, where garbage, filth, stinking fish, and other abominations are thrown. The smells along the byepaths and beach in the neighbourhood of the towns and villages are most offensive from accumulations of human ordure and offal; in fact, the native population is unrestrained by any police rules except at Cape Coast and Accra. In both towns, the municipal corporation have enacted laws for their conservancy; but in reality they are a dead-letter, and hence an amount of nuisance scarcely credible. In the other towns, the Paynims, or native police, utterly neglect important matters of this kind. Indeed, the inhabitants of Cape Coast, and the other towns and villages, are chiefly indebted for their partial cleanliness to those useful scavengers, the Turkey buzzards, largely helped by packs of half-starved, mangy curs and ill-conditioned hogs, who greedily devour the excrementitious matters which are left to rot upon the streets. A ravine, evidently the bed of a dried-up stream, intersects the eastern portion of the town; the huts of the natives being built upon its banks, rise upwards to the slope above them. This vast surface-sewer is strewed over with animal and vegetable refuse in every stage of decay. It is perforated in a great part of its course by holes which the people dig for water. At the seaside, where it terminates, the surface-water is dammed up by the sand thrown up by the surf on the shore, and is there collected into fœtid pools. The thorough cleansing out and bridging over of this gully, at the most convenient points, would materially benefit the health and comfort of the inhabitants of Cape Coast. The municipalities of Cape Coast and Accra being at present without adequate means to effect sanitary improvements, progress in abating nuisances will be of slow growth if unaided by the local government.

The town of Cape Coast is irregularly built; the houses are constructed of clay or bricks, and are generally square. In some of the rural districts they are made of bamboo, wattles being woven between the upright posts, which is then plastered over with clay, which becomes, when dry, remarkably hard. The walls of their dwellings are rarely if ever whitewashed, and are often crowded, ill-ventilated, and dirty. Most of the rooms are miserably small, dark, damp, and badly ventilated, especially those devoted to sleep. In their sleeping-places the poorer classes, and many persons in better circumstances, keep all the dirty clothing not in wear, either about their beds or hanging from the wall, scraps of food and putrid fish being strewed about or collected in corners. The lower rooms

open into inner courts, where, in fine weather, the members of the several families meet, and where they often cook and eat their food. The houses of many of what may be termed the middling class are well provided with European articles of cabinet furniture, with crockery, glass, and mirrors, while the walls are decorated with cheap prints. Indeed, in many of the houses of the poor, their children paste over the walls with prints from illustrated journals, having quite a passion for this cheap kind of ornament. The wealthy native gentlemen live in well-built houses, commodiously and often elegantly furnished; but few of them have fire-places either in the public rooms or bed-rooms—a want which impairs health in a country exposed to heavy night-dews, and in some wet seasons to heavy falls of rain. The general custom on the Gold Coast is to burn charcoal in clay pots in the public rooms and bed-rooms when the weather is damp or cold. This practice is not without danger, as on one occasion I was called to render aid to a man whom I found had been asphyxiated by the fumes of charcoal to which he was exposed in a close sleeping-room. From inquiries that I have made, I found that twenty may be safely reckoned the average number of tenants living under one roof in the two-storied houses in Cape Coast; and it often happens that sober, decent people dwell in one apartment, and a drunken man in the next; for I regret to say that drunkenness is a wide-spread vice among the natives—a circumstance chiefly dependent upon the cheapness of the spirits imported from the United States and the Brazils. In these houses, the well-conducted are too often pestered and annoyed by their disorderly neighbours, and the most violent altercations frequently occur between the members of the different families. On these occasions they seldom come to blows, but content themselves by heartily abusing one another in the foulest language they can lay tongue to. Such quarrels, although they may commence among the male branches of the family, are almost invariably taken up by the female members, when the men cease their angry recriminations, and listen with much complacency to the scolding of their wives and concubines, the contending women rushing up to each other, gesticulating in the most frantic way, screaming furiously, and vociferating in the loudest tones—each of them, in this war of words, being backed up by mutual friends among the spectators, to whom they constantly appeal to support their vituperations. In this way their children grow up, and become accustomed to the continual recurrence of such scenes, and suffer corresponding neglect; sometimes petted until they become wilful and in-

sufferably perverse; at other times unmercifully beaten, the domestic peace being occasionally disturbed by their mother's cries when tied up and beaten by their fathers with fist, stick, or whip for some connubial fault. In these abodes, the laws which govern health are therefore utterly neglected, all kinds of refuse and filth being allowed to accumulate in and around them. In the rainy season, and especially during the "smokes," or dense foggy weather, the pernicious effect of these local contaminations is more sensibly felt in the spread of dysentery, diarrhœa, remittent and intermittent fevers, and in the prevalence of pulmonary disorders—other exciting causes being also in active operation. Perspiration, for example, is checked by the damp air and vicissitudes of temperature, giving frequently rise to internal congestion, languid circulation in the liver, and functional disturbance of that organ. Nevertheless, some cause other than these must be at work to account for their yearly prevalence and the high rate of mortality; and this, it appears to me, can only be accounted for by the diffusion of a specific poison of a malarious, and partly of a scorbutic nature.

I feel convinced that these organs, which bear the first brunt of the vitiated air in their overcrowded and close rooms, soonest suffer. This is the case with the eye and ear, as well as the lungs, and the numbers by whom I was consulted suffering from hæmoptysis, ophthalmia, or otorrhœa, bears out the truth of my assertion. But besides these fertile sources of disease, the poverty of the mass of the people ought to be taken into account in dealing with this subject, because the long train of evils which spring from it are so formidable, that although benevolence may mitigate, it cannot prevent them.

I have before stated, that the houses in Cape Coast (and this remark is equally applicable to the other towns) are so closely connected that a free current of air between them is much impeded; and these narrow spaces and the public highways are further polluted by the surface-drainage, which at present is allowed to escape freely from the houses upon the streets, and still further contributes to the unhealthiness of the town. As each house or hut contains a number of families, the population is condensed, and the extent of the town is correspondingly diminished in size. The population of Cape Coast and suburbs may be fairly estimated at 8,000 persons, including men, women, and children, but in the event of a hostile attack, that number could be further increased by 6,000 men from the adjacent villages. The number is, however, largely aug-

mented by a fluctuating population who visit it either to trade, to have their political palavers discussed and arranged by the Government, and by the crowds constantly passing to and from towns and villages on the sea-board, and from the rural districts, to the court of the judicial assessor.

There are two badly situated graveyards in Cape Coast, both being in the windward part of the town, one of them being, moreover, surrounded a dense population; and these cemeteries from their position are very injurious to the health of the community. But besides these burial places, wherein Christians are alone interred, graves are at present allowed to be dug on the beach for certain of the pagan population, and slaves are buried without restriction to position along the pathways of the suburbs of the town. I recommended that these Christian burial-grounds should be closed up, and that cemeteries should be opened to the leeward of the town, where there is abundance of land lying waste suitable for the purpose, where a piece of ground might also be set apart wherein to bury the dead of the pagan and slave population. The mass of the inhabitants bury their dead in the basement floor of their houses,—a practice *not* confined to the pagan part of the population, but also practised by many respectable and wealthy families. This hurtful custom cannot be too soon discontinued. It is not done by the natives of the interior, but by all accounts it has been an ancient custom in the coast towns. When the deceased is wealthy, valuable articles, as gold ornaments, gold-dust, aggery-beads, etc., are placed in the coffin, and the body is sprinkled with gold-dust. These tombs in this way become family-banks, and in the time of trouble the gold so deposited is applied to meet pressing claims, or other family purposes. The practice of depositing articles of value with the dead is of very ancient origin, for King David had large treasure placed in his tomb by his son Solomon. I may here mention, that several persons have been buried in the floor of the medical store of the Colonial Hospital, in the surgery, and in the kitchen used by the female prisoners. Suitable epitaphs are engraved on marble slabs which mark the spot where two of the dead rest.

The natives are generally tall and well formed, thick lips and flat noses being little seen among them. On the contrary, many of their noses are fairly prominent, and several are hooked. Many of the men allow the beard to grow, and moustaches and whiskers are very generally worn by them. The young women are remarkably pretty and modest in their demeanour. Their feet and legs are generally finely

formed; but several of the women walk badly, or are pigeon-toed, as it is termed. The people are as a body courteous, kind, and hospitable, easily excited to anger, but it is soon appeased. Perhaps they may be more suspicious than the natives of cold climates; but they are nevertheless a sociable and joyous people. Their worst fault is a propensity to lie; and this vice is exhibited to a lamentable extent when giving evidence in our courts of justice. Servants also consider it no crime to rob the white man; and, so long as they are undetected, they do not lose cast among their equals, although the latter may be aware of their thefts. In a general point of view, they may fairly be considered as a well-meaning people, allowance being made for their present state of civilization. They possess no small share of benevolence, honesty, and sincerity; but I am bound to state, that these good qualities prevail to a much greater extent among the people of the rural districts, than is generally the case among the inhabitants of the waterside. On the coast the people too often imitate the bad qualities of some Europeans; and but few of them acquire, or seek to acquire, the energy, firmness of character, and good conduct of the majority of the white races who dwell among them; steady, industrious habits being certainly more encouraged inland, where vice and profligacy are more checked than on the sea-board towns. The main cause of a vast deal of this immorality is clearly traceable to the universal prevalence of domestic slavery. The whole of the social fabric, "woof and warp," as was justly stated by Sir B. Pine, is slavery. With respect to domestic slavery, an able writer in the *West African Herald* correctly remarks, that in our courts of justice equitable regard is paid to the local customs of the natives, so far as the same are not repugnant to Christianity or to natural justice. But in a country where slavery pervades society, from the heir to a chiefdom to the meanest servant, and where every man has from time immemorial looked upon his children and slaves as the most valuable property he possesses, it is impossible to abstain from questions between master and slave, and disputed rights of slaves; inasmuch, *as claims are frequently set up by individuals to whole families without any foundation, and if these were not examined and determined, the subjects of such claims would inevitably be reduced to slavery whenever a claimant had the power to enforce his claims.* The British magistrate, *while rigidly abstaining from interfering to enforce slavery, always endeavours to mitigate as far as possible the evils inherent in the system,* taking care not to violate the long established laws and usages of the country. Power has been always assumed to emancipate slaves found to

have been treated with cruelty; and this power seems to be acquiesced in by the natives, although in many cases submitted to by them with great reluctance. It is the principal means we possess of checking and ameliorating the evils of domestic slavery. Upon the Gold Coast the relations of master and slave are much the same as we read of in the Old Testament; for they are treated as members of the family, especially in the rural districts. Slaves by their industry frequently accumulate considerable property, and become the possessors of land and slaves, over which, although the master claims rights of very indefinite extent, yet of which custom prevents him from wantonly or to an unreasonable extent depriving them; and by means of which, in the event of disagreement with their master, slaves not unfrequently redeem themselves by purchasing their freedom. Slaves on the coast are, however, beginning to be restive, and frequently manifest their impatience of the galling yoke of bondsmen. A custom formerly prevailed among the chiefs and headsmen to devote from early youth certain male or female slaves to be sacrificed at their death, to attend and serve them in another world. These slaves were called "Okroes", a word signifying the soul or spirit. They were always treated with consideration, and were the admitted confidants of all their master's secrets. A necklace to which a gold locket is secured is worn by them; for although human sacrifices have never been tolerated by the British Government, the custom of having "Okroes" has survived the interdict. The majority of the slaves are brought from the country beyond Ashantee, and are eagerly purchased by the people of the protected territories. The enslaved people are called "donkos"; and in my opinion their introduction, although in the first instance a very great evil, has yet carried in its train much good. They are a hardy, enduring race, and where their good qualities have room to expand, they are found to be a brave and trustworthy people. Their services during the Crobo revolt in 1858, and trouble in the Abrah district in 1859, showed their value as soldiers; and their intermarriage with the Fantees, and other indigenous tribes, will improve the latter races.

The dress of the men consists of a piece of cloth loosely wrapped about the body, but they likewise wear besides a cloth round the loins. In saluting their superiors, they remove the cloth from one of the shoulders. The women dress much in the same way as the men, but they wear a zone of beads round their loins. To this girdle a pad, or bustle, called "cankey," is fastened above the buttocks, upon which they place their infants when at work, or when

travelling from home. They are fond of adorning their persons with necklaces, bracelets, and rings. Upon their feet some of them wear brass rings, which are of an oval shape, and made to surround the heel, and reach to the middle of the foot. On the toes many of them wear brass rings, which women of the higher ranks exchange for gold rings on special occasions. In general the women appear in public with the breasts uncovered; their garment is secured to the waist either by a girdle, or by simply wrapping it lightly round their persons. Women of rank and fashion have a number of keys suspended by a ring to the girdle, which, jingling together, serves to announce their approach. Some of the men and women are in the habit of wearing round one of the wrists a few of the front teeth of deceased relatives strung necklace fashion. The hair of the young girls is neatly plaited into corkscrew curls, and women of maturer age wear it brushed from before and behind into a pyramid supported by an internal cushion, and secured by a handsome back comb plaited with gold. They are very fond of perfumes. In the coast towns a proportion of both sexes wear European clothing, and no expense is spared to obtain the best and newest style of dress. Too often, this love of dress becomes quite a passion among the young people, and its inordinate indulgence occasionally leads to pilfering and other dishonest acts. The mass of the people are pagans, but a good many profess Christianity. Considering the long period that has elapsed since the Gold Coast has been under the protection of the British Government, little progress has been made in the knowledge of our language, as comparatively very few of the people can speak English.

The food of the mass of the population chiefly consists of vegetables, with fresh fish, and dried fish in excess, often so highly ammoniacal as to be commonly known under the name of "stink fish," with land snails, and sea and land crabs, and crayfish. But their principal dish is made with fish and fowl singly or together, to which freshly-made palm oil, red peppers, salt, with shallots, or, as a substitute for the latter, the bark of a tree called "edooah ahyew," (which resembles the onion in flavour and taste,) bitter tomatoes, or ocroes, are added. They eat this highly-seasoned stew with unleavened bread, made of Indian corn called "cankey," or with pounded yams, or plantains, which, when cooked, is called "foofoo." The palm oil, when recently expressed (and it is very seldom used except in a fresh state), is delicate and wholesome, and quite different from the rancid palm oil imported to England. They are in the habit of eating once or twice a day, and often

distend the stomach with bulky food to such an extent that its functions, and those of the liver, become disturbed and weakened nature relieving herself by passing the indigested food away in the form of diarrhœa. Hence, it follows that the food of the black and coloured population generally is less nourishing and stimulating than that of the European, and they consequently suffer so little from fever; but, nevertheless, when attacked with disease, the vital vigour of their constitution is so slight that they are less able to bear up against the shock, or to rally when the powers of life have been reduced by physical depression.

The men and women eat separately, three or more placing themselves round the dish of soup or stew, into which they alternately dip the "cankey or foofoo." In general they do not drink with their meals; but after the repast they sometimes drink freely of palm wine or rum.

Tobacco is largely smoked by both sexes. Great part of the food of the people on the coast consists, as I have just stated, of bread made from Indian corn, while the natives inland subsist, chiefly, upon yams, cassada, sweet potatoes, and plantains, and in this respect the former are certainly in advance of the latter, as the use of cereals as food has always been accounted a marked step in national civilization.

With regard to animal food, there is considerable difficulty in procuring regular supplies, as butchers' meat is not sold in the markets; consequently, Europeans must either kill a goat or sheep, which is both expensive and wasteful, or they are obliged to purchase a much larger quantity of the mutton or goat's flesh that is offered for sale than they want, or will keep wholesome until used up. Beef is rarely to be got on the windward coast; but at Accra very good beef can be obtained. Poultry is, however, abundant, reasonable in price, and, although small, is well-flavoured, and turkeys from the Leeward districts may occasionally be obtained at fair prices. The vegetable market of Cape Coast is much better supplied than that of Accra. In the former, yams of the finest quality, cassada, ocroes, sweet potatoes, calavances, pumpkins, with calciloo, an excellent substitute for spinach, may, one or other, be had all the year round, and excellent cabbages are occasionally offered for sale. Bitter tomatoes, peppers, shallots, &c., help to season the food, and render it more piquant. The sameness of the diet may, moreover, be varied by preserved meats and vegetables; but the high prices demanded by the merchants for these articles at present restrict their use, and, in fact, operate as a prohibition to their more general consumption. Cape Coast is pretty well supplied with fish; but the bulk of

the fish taken consists of a description of herring, which are cured in large quantities by roasting them for the home market, or they are sent into the interior, and to the Ashantee country, where they are in great request. At Cape Coast the fishermen do not use deep sea lines, but merely hand seines—a circumstance which prevents their taking the larger and finer kinds of fish, which swim at a depth out of the reach of their nets; but at Winnebah, Accra, and Pram Pram, the fishermen fish with deep sea lines, and, consequently, much larger and finer kinds of fish are taken at these places than is the case at this station. Many of the country-cooked dishes which are brought to table in the native-made pots in which they are cooked, are good and wholesome, and excellent as a change of diet. In cooking, the natives prefer to pound their food. Thus yams, plantains, and cassada, are triturated between stones, and served up under the name of "foofoo," and are eaten with soup, meat, or fish.

Fruit, contrary to what might be expected, is scarce, and often cannot be procured. Compared either with Sierra Leone or the Gambia, the supply is indifferent, and the variety is at present limited to pines, limes, sour sops, bannanas, and plantains, the water melon, papua, tiger and ground nuts. Good oranges are occasionally to be got from "Shumah," but they are not sold in the market. Cocoa nuts are abundant, and the milk is a most refreshing and wholesome beverage, which can be freely drank to allay thirst. It ought, however, to be taken from the young nut.

A great deal of sickness and disease is caused by the impurity of the water, which is obtained by the bulk of the people from ponds originally hollowed out in procuring clay for building their houses. The surfaces of these reservoirs are covered with a broad-leaved duckweed and rushes. These plants screen the water from the sun, prevent evaporation, and contribute to its coolness and freshness. But it is too often turbid and unwholesome. I have sometimes met with water taken from a distance in the bush which was drawn from pools collected in natural cisterns in the rocks, which in colour resembled dark sherry, yet its taste and flavour was not unpleasant. The colouring matter had been derived from the leaves of the surrounding trees falling into the water.

In the forts excellent water is supplied to the troops from large tanks. But the supply in Cape Coast is at present very inadequate to meet the wants of the townspeople, and in the dry weather, or in seasons of drought, as was the case in 1858, it must be procured from springs in the bush, or from the

"Sweet," or "Aquatechie" rivers. A number of wells, dug, I understand, by the Portuguese, are situated near the head of the ravine referred to in my description of the town of Cape Coast; but, as they belong to private families, they are kept carefully locked up, and are only accessible to a privileged number of the community. An unfinished tank, built by subscription, and which, I understand, cost £1,500, was erected near the centre of the town, and if it is ever completed, will prove of the greatest advantage. In 1837, I was called upon, as a member of a commission, to report upon and examine the sanitary condition of Cape Coast Castle. The tanks were, at that time, in a most unsatisfactory condition, being polluted by feculent matter washed into them from the badly arranged privies. Since that report was made the tanks have been cleaned out, and porcelain tubing now conveys the water along the spur and great triangular spaces to them. The appointment of the commission also led to a strong representation to the head of the Commissariat Department for a supply of filters for the use of the officers in garrison, which was at once complied with. This boon they owed to that talented officer, D. A. Commissary-General R. D. Ross, whose friendship I had the happiness of enjoying while resident on the Gold Coast. I may here state that there is good grounds for believing that the surface water which falls upon the castle yards penetrates into the numerous graves below, and from thence finds its way into the adjoining tanks charged with the corruption of decaying humanity. The water which enters the tanks is, I regret to say, still unfiltered, although expensive materials were lately sent out by the Government for that purpose. To render the tanks complete, these filters should be erected as soon as possible, and the tanks should be made perfectly watertight, which they were not when I left the coast in August 1859. Another point would be to obtain an abundant supply of water, and this could readily be effected, at a moderate expense, by boring and constructing wells. It might, indeed, be easily conveyed from the Sweet River into the town, and the only obstacle at present opposed to its execution is want of means to carry out the project.

Polygamy exists on every part of this coast, and a man may have as many wives as he can maintain. The wealthy men have a number of wives, whom they neglect or caress in proportion to their sensual appetite; but the first wife has the sole management of the domestic affairs indoors, while the husband attends to the planting of corn or yams in their

season, etc. The women are not confined, but they are, nevertheless, jealously watched by the first wife; and should she discover any liaison of the other wives or concubines, she is sure to be well rewarded for her diligence. It sometimes, however, happens that the lady herself, if she has not lost her charms, is suspected, when she is tried by the fetish ordeal of drinking an infusion of the melley-tree. The priest having administered the oath of imprecation, the woman swallows a small portion of food, and taking the calabash of red water in her hand, prays that its contents may prove fatal to her if she does not tell the truth. Should the food she has swallowed be ejected from the stomach, her innocence is at once established; but if she dies, her guilt is considered proved. Vomiting, purging, succeeded by collapse, the forerunners of dissolution, are not unfrequently the consequences of the sickening draughts of the red water.

Wives are regularly contracted for, even in childhood; and the mother has the uncontrolled right of disposing of her daughter's hand in marriage. When betrothed, it is the lover's duty liberally to bestow presents upon herself and parents. After a certain amount has been paid by the lover, which sum is regulated by custom and is considered dowry money, the marriage takes place in the presence of assembled relatives and friends. The lady is dressed and decorated, according to her rank, with a garment of rich silk or cloth, gold ornaments, and valuable beads. The bridegroom presents the father with cloth, tobacco, rum, and gunpowder, or gold-dust, when the ceremony is considered complete. The bride is escorted by her husband's female relatives to his home, where she is received with some ceremony by his relatives and friends. The day after the marriage, she is visited by numerous friends anxiously inquiring for her welfare. For a week after the marriage, she must wear her best clothes, and appear in public to show that she has got married. After marriage she becomes the *property* of her husband, and his authority over her is absolute, and cannot be disputed.

When a woman becomes pregnant for the first time, she gives oblations to the fetish, and she likewise walks through the public streets and places attired and adorned, with a few female friends, to intimate her interesting condition. Young girls, in whom the catamenia have never appeared, are considered accursed; and formerly this circumstance served as a pretext for remorselessly selling them into slavery, or offering them up as sacrifices to the fetish, and this was done, although they might be free-born persons. On the first appearance of

the catamenia, girls are exempted for some time from work, and are visited and congratulated by their relatives and friends on having arrived at womanhood. Before, however, these congratulatory visits take place, they are taken by the women to the sea or to a brook, and carefully washed, the nails being closely pared, and the arm-pits and mons veneris depilated. They are then perfumed, and elaborately dressed, the face, arms, and neck being painted in various patterns and with different colours. The devices are generally diced or horizontal lines. Gold coins are frequently neatly tasselled among the hair; and a necklace of gold, aggery, or other beads, is generally worn round the neck; the arms, wrists, and toes being adorned with gold or silver armlets, bracelets, anklets, and rings. The whole of the upper part of the body is naked to the waist, the rest of it being gracefully enveloped in a showy piece of silk or other stuff. Thus attired, the girl in the afternoon is paraded through all the streets and public places, accompanied by a troop of young females and elderly women, a parasol being held over her head by one of her friends. The ceremony is performed to let the young men know that she is marriageable. The women suckle their children until they can walk. Both sexes generally go about naked, with the exception of a loin-cloth, until the age of ten or twelve.

The Accras are the only people on the Gold Coast who practise circumcision, and this circumstance is remarkable, considering they, of all the tribes, stand alone in this respect. The rite is performed when the boys are about ten or twelve years of age.

The obsequies of the dead are celebrated for several days by a conjunction of wailing, condoling, and carousing; and if the person is of consequence, this custom is observed very extravagantly. A sheep is sacrificed at the death of a person of moderate circumstances, and several sheep or bullocks upon the death of a chief or wealthy man. The fore-shoulder of the sheep is placed upon the grave. The custom is kept up by volleys of musquetry, masquerading, and drinking of rum and palm wine. The noise of the shouting, wailing, singing, and drumming, intermingled with piteous groans and exclamations, at these wakes is astounding. The saturnalia is carried on at intervals until the body is buried. The women throw dust on their heads, and, like the Jews of old, shriek and lament, as if they could recall the soul from the world of spirits. These outward noisy demonstrations of sorrow are acted by persons hired for the occasion. When the funeral is over, and calmness restored, real grief is beheld, and the house

then becomes, in sober earnest, a house of mourning. The head is generally shaved as a sign of mourning; but the women are shaved by their own sex, for the men are so jealous, that if it were done by a male it would, in all probability, be made the ground of a criminal charge against him by the woman or her husband. The celebration of the funeral custom on the Gold Coast is a fruitful source of crime, leading to quarrels and fights, and above all, is a grievous burden to the family, by causing them to incur enormous expense. All the relatives and slaves of the deceased each contribute something in the shape of gold, cloth, spirits, tobacco, or gunpowder, towards the expense; nevertheless, it too often is so ruinous that it can only be met by pawning or selling some member of the family into domestic slavery. This barbarous custom is therefore one of the most active means of perpetuating the pawn system and domestic slavery; for however poor the person may be, every effort is strained to have the funeral obsequies of their relatives well performed. The serious consequences of all this will be better understood when it is known that fifty per cent. is given for the loan of money on the Gold Coast, and that that amount is exacted whether the loan is for a day or for years.

Should a man die insolvent, the body, formerly, was not buried until his debts were discharged. Not long ago, the bodies of persons who had been pawned, or had re-pawned themselves for money due to another, were denied burial rites until their death was verified. The body was placed upon a platform erected in the direction of the creditor's residence, and nearest the part of the country whence the dead pawn had come. It was either tied up in a net, or put in a rough kind of coffin, and left to rot. This was done to enable the creditor to recover his money from the family of the deceased pawn; and to this end it was indispensable that he (the creditor) should be able to prove the fact of the death of the individual, and that he had not sold the pawn into foreign slavery. This fact established, it then became necessary that the family of the dead pawn should either pay the debt or give another pawn or other security before the remains could be interred. Frequently the body remained so long unclaimed that nothing but a skeleton was left to be identified.

When the natives lose in succession one or two children by death, they mark the next born by making one cut on each temple; but should that child also die, they mark their next born by making three vertical and one transverse incision across the temple, these cuts being so made that the marks are

indelible. Should the death of their children occur frequently, they sometimes throw the body of the child which has died last into the bush to be devoured by wild beasts; but they attribute any congenital deformity that may appear in the child that may be born after this barbarous custom to its having been so injured when cast into the jungle, as they firmly believe that the child that has been born defective is the same child whose body they had flung away. This circumstance shows a belief in the doctrine of metempsychosis.

The women of the lower orders wear strings round their legs, and often above their ankles, and these ligatures are generally so tightly drawn that the cord leaves a deep mark upon the skin, showing that the return of the blood in the cutaneous veins had been interrupted. Sometimes these ties are fetished, to cure their pains, when they are knotted, a piece of blue or scarlet cloth being attached to the cords.

Children born with supernumerary fingers or toes are looked upon by the superstitious people of the Gold Coast as witches. In one instance, which came to my knowledge, the infant was on this account, soon after its birth, burnt alive; and in another case, the child was destroyed by twisting its neck, when it was buried in a dungheap. Both these atrocities were committed in the district of Wassaw, several days journey from Cape Coast.

The natives who profess and practise the medical profession are either women or men. The former scarify and cup with much dexterity, letting blood from the veins of the hands and feet to relieve local pains; but venesection from the arm is not practised. Leeches, although abundant, are not used by the natives. In selecting various herbs and plants, they discover no mean power of observation; for there is scarcely a plant without its peculiar healing action being known to them. This knowledge is seldom imparted, but is transmitted from generation to generation, and is generally confined to a female member of the family. The men who practise medicine are ranked with the fetish priests. They do not profess to cure disease in general, but devote their attention to the relief of special ailments. Thus they will, when applied to, say whether they have or have not any skill in the treatment of the particular complaint, or, as they express it, "they have no good medicine for its cure." The consequence is, that there is a vast number of country doctors, each boasting of his skill in the management of his own speciality. Many of them, however, are mere empirics, and deceive their patients by their tricks. Sick persons travel or are carried great distances into the in-

terior to put themselves under a native doctor having a reputation for curing the particular disease they may at the time suffer. The doctor's fee varies according to the rank of the patient; but it is in general a dollar, 4*s.* 6*d.* sterling, a fowl, a goat, or a piece of cotton goods or cutlery, &c.

The chiefs and people entertain a firmly rooted belief in witchcraft; and also that certain fetish persons and country doctors are skilled in preparing poisons of a nature so subtle, that they may be safely used against their victims without the risk of discovery. These fetish persons are frequently consulted by parties seeking revenge on others. If the person to be fetished is a man, they sometimes induce a female confederate to lure him to her embraces; but, before this takes place, her abdomen is punctured, and pounded leaves, or the bark of certain trees, are rubbed into the punctured skin. In the morning she discloses the fact of having fetish medicines about her person, to the great horror and alarm of the dupe, who at once imagines that his virile powers are destroyed. In this lamentable condition, days are spent in trying the effect of a variety of medicines and charms to counteract the fetish; but at length, driven to despair, he goes to the fetish man who had made the preparation for the woman, when possibly, by the most abject supplication and liberal presents, he induces his persecutor to relieve his infirmity. Thus the imagination is worked upon in removing as well as in implanting the curse, and the man departs with his virility restored. The fear of coming into contact with pernicious substances is displayed in the care manifested by the chiefs and headmen that none shall sit upon their stools or chairs during their absence. For when they assemble in council, or come into our courts, an attendant slave is always in charge of their seats; and when he rises to speak, or leaves the court, the chair or stool is placed upon its side to prevent fetish medicines being put upon it. Women equally dread the effect of fetish medicines, which they believe can induce sterility, alienate their husbands' affections, or cause some other evil to befall themselves or children.

People put into fetish are, *de facto*, excommunicated; becoming, for the time, pariahs from society. Shunned even by their friends, they wander about, and either yield to the cruel behests of the fetish priests, or, withdrawing into the recesses of the forest, perish miserably by their own hands. The pernicious influence of this evil was carried to such an extent, that, in March 1858, the local Government issued a proclamation forbidding the practice of putting, or threatening to put, people into fetish, severe punishment being denounced against

persons infringing this decree; but the Government cannot at present strictly enforce this law, from the great distance of many of the districts from head-quarters, consequently it is often violated with impunity.

Impotence, as may be inferred from the foregoing remarks, is a common complaint on the Gold Coast. They call the disease broke-back; and frequent applications were made at the dispensary for aphrodisiac remedies to restore their virility, or, as they term it, "strengthen their back."

In taking a retrospective view of the diseases which came under my observation during a service of nearly twenty-three years duration at Sierra Leone and the Gold Coast, my experience is opposed to the theory entertained by many people, that the uncivilised are, to a great extent, exempt from the diseases which afflict their European brethren. I may here remark that in them fevers are generally slight, the acute stage soon terminating in determination to the bowels or skin; and although its progress is distinctly marked by remissions, it seldom lasts longer than twenty-four hours. They sometimes suffer a good deal from intermittent fever, and continued fever with typhoid symptoms; but, as a general rule, the foregoing remark will be found correct. I have heard and read of negroes taking yellow fever, but in no case did it happen at Sierra Leone during its prevalence in 1837, 1838, 1839, 1847; nor, as far as I understand, in 1859. No example of it occurred to any of my medical brethren in the course of their practice; and, as far as my observation extends, it rarely attacked persons of mixed blood—a circumstance I had the most ample means of noticing while engaged in mitigating the ravages of the yellow fever in the years just quoted. It is, however, worthy of record, that yellow fever and epidemic small-pox prevailed in 1837 and 1839, the latter preceding, accompanying, and disappearing nearly at the same time as the former. Persons dying of small-pox at Sierra Leone have, by mistake, been put down as cut off by yellow fever. This occurred last year, when the Colonial Secretary, a mulatto gentleman from the West Indies, was reported in the *Times* to have died of yellow fever, whereas he died of epidemic small-pox.

In the period comprehended in this report, no epidemic prevailed. Rumours were current at different times during the year of the appearance of small-pox at various stations; but these statements were exaggerated, and in most instances unfounded. At least, I saw no case of small-pox during the year, and I feel satisfied I would have detected such

cases, notwithstanding that the natives do everything in their power to conceal its presence by the immediate removal of the afflicted persons into the bush, I may here mention the remarkable fact, that few persons among the population, whom I have had ample opportunities of observing in different parts of the protected territory, are marked with small-pox. With regard to vaccination, I regret to state that it failed in every instance in which it was repeatedly tried both by myself and several of the military medical officers. This circumstance in no way weakens my firm belief that vaccination will succeed on the Gold Coast; for there is unquestionable living evidence of its having formerly succeeded well. At Sierra Leone I have known it fail in hundreds of instances, but ultimately succeed well, and be kept up for many months at a time; and assuredly a similar result will happen in these settlements if the medical officers, instead of being disheartened by repeated failures, are incited to renewed efforts to introduce this inestimable blessing among the natives of the Gold Coast. That nothing might be wanting to secure this object, I suggested that no pains should be spared in charging to the utmost the bone-points with lymph which are sent out to this part of the coast, as I feel convinced attention to this apparently trivial circumstance will largely contribute to the success of vaccination there.

The natives sometimes inoculate for the small-pox, which they do by inserting the variolous matter into a puncture upon one of the wrists. In confluent small-pox they open the pustules, lubricate the body with palm or nut oils, and cause the patients to take warm drinks, and keep them nestled close to the fire. I saw a good many persons who had lost the sight of one or both eyes from small-pox; and this is not surprising considering the close and foul air which the patients breathe during their treatment by the native doctors. On the Gold Coast, no custom is made for persons who die of small-pox.

A few persons labouring under measles were brought to me during the year; but the disease, I am glad to state, did not become epidemic, as in 1857. At Accra, I several times saw children, when covered with the eruption of measles, rubbed over by their mothers with dust picked up from the street.

Several of those treated at the hospital during the year, had, in the first instance, been applicants at the dispensary. A large proportion of those who attended were affected

with old-standing scrofulous ulcerations of the skin, and these persons had their sores daily dressed, while, in several cases, their ulcers were caused by caries, or necrosed bones, and, consequently, the reparative process required weeks, sometimes months, for its completion, and not unfrequently they no sooner healed up than they broke out afresh. A very large number of those prescribed for suffered from the most inveterate skin disease. Scabies, called kra-kra on this coast, is a common disease, and is very infectious. It is frequent among children, and the slave population are seldom without it, the disease being induced by the poverty of their diet, bad ventilation, and dirty habits; but, nevertheless, they do not appear to be much inconvenienced by it. The poorer class of people and slaves also suffer much from yaws. Persons affected with psoriasis palmaris came occasionally under treatment; and a great many afflicted with herpetic eruptions, situated on various parts of the body, were constant applicants for relief. Cases of noli me tangere, affecting the nose, lips, and other parts of the face, sometimes presented themselves. From having met with persons in the inland parts of the country affected with it, I am of opinion it is a rather prevalent disorder among the people. In the worst and most intractable forms of skin diseases which I was called upon to treat among the natives, I found the solution of the arsenite of potass by far the most useful medicine.

Cancrum oris is occasionally met with in children, several infants being brought to me where the cheek was penetrated before my advice was sought by their parents. The disease appeared in some of them during teething.

Glandular swellings in the neck, or axilla, were frequent subjects of treatment; and occasional cases of goitre presented themselves for relief. Persons labouring under cataract, iritis, and amaurosis were frequent applicants at the dispensary. The number of persons blind from cataract and amaurosis is very considerable; but the number of deaf and dumb people is much less. Many were afflicted with acute or purulent ophthalmia, which, from having been neglected, had destroyed vision. Ophthalmia tarsi is of frequent occurrence; and I was frequently consulted in cases of functional deafness, tinnitus aurium, and for chronic inflammation and thickening of the membranes of the nose and mouth. A relaxed state of the uvula and ulceration of the tonsils are complaints to which they are very liable. Cases of nasal polypus sometimes applied for relief. When suffering from cold or stuffing in the

nose, their applications for sternutatories were urgent, as they have great faith in the virtues of pungent-smelling articles to remove such affections.

Several cases of severe and dangerous wounds were treated in hospital. A boy, about ten years of age, sustained a punctured wound of the belly, with protrusion of the omentum, by falling upon a stake, and a man was admitted with an extensive laceration of the scrotum, the left testis having been torn from its envelopes by the teeth of his infuriated wife.

Among the minor operations I may mention that a tumour, which had originally been a cicatrix raised on the skin by way of ornament, was removed from between the breasts of a young woman. Several young females also applied to have steatomatous growths of one or both lobules of the ear removed; and in all these cases I took away both lobule and tumour. These tumours had been caused by the chronic irritation set up in the lobules by piercing them for the introduction of ear-rings. Many persons suffering from dry gangrene of the little toe came to the hospital to be operated upon. Dry gangrene, especially of the little toe, I have observed is a disease of rather common occurrence among the natives of the Gold Coast; and from inquiries I have made on the subject, I find that it is frequently a sequence of suppressed yaws.

With respect to more important operations, I removed the left leg of a man sent to the hospital from Ammalive, suffering from a compound fracture of the tibia and fibula about the middle third. This was the fourth person who had their limbs successfully removed since my arrival on the Gold Coast; and I take this opportunity of recording my conviction that the natives do not display more repugnance to submit to operations than people do elsewhere.

The natives are very liable to constipation, consequently there were numerous and constant applications for purgative medicines to remove this unpleasant condition. Crowds of persons, of both sexes, may be seen upon the beach at early morn, with various medicated decoctions, which they blow into the bowels from a bottle-shaped gourd in order to obtain relief. This constipated state of the bowels, in my opinion, chiefly arises from the unstimulating nature of their diet. This practice has the bad tendency of relaxing the lower bowel, and I have no doubt that its constant repetition weakens the muscles brought into action in the process of defecation, so that it induces and confirms the complaint it is daily used to obviate.

They consider it most indecent to eructate; and a woman guilty of this breach of manners would be viewed with abhorrence.

A good many persons afflicted with lepra applied for escharotics, but in them the disease had taken far too firm a hold of the system, and had reached its advanced stages, for any class of remedies to cure the malady, the joints of the fingers and toes having dropped off, the soles of the feet being perforated by leprous ulcerations, and the features generally disfigured by lobulated tumours. It appeared to me most prevalent among the slave population, many of whom had no owners, and who were obliged to pick up a miserable and uncertain subsistence, without clothing, unless the dirty and scanty rag which hid their nakedness could be so described, and who were housed in dens reeking with filth, and redolent of squalor and misery.

The leper is frequently paralytic in one or both feet; the controlling power is lost, and the foot flops down suddenly, as if hinged upon the leg.

Elephantiasis and lepra in all its hideous forms prevail, and sarcomatous enlargements of the scrotum frequently attain such dimensions as to reach to the knees, and even below them. The disease is said to prevail more on the windward than on the leeward part of the coast. The natives suppose it may be induced by drinking excessively of palm wine which has been mixed with the juice of the bamboo; but it may, with much greater reason, be accounted for by an excess of fish diet. No pain is felt in the tumour, unless it is left unsupported, its weight apparently causing it by the dragging of the cords.

With regard to lepra, young persons of both sexes, and even infants in arms, were brought to me, in whom it appeared in copper-coloured patches, on the breast, between the shoulders, face, or upper extremities; in many cases it being clearly traceable to hereditary taint. The fingers and toes swell greatly before ulceration, after which they drop off, or are "cut," as the natives term it, much pain having been felt in them, generally at night. The feet and ankles become enormously enlarged and deformed. Foul defœdations appear chiefly upon the neck, arms, and legs, the skin of the other parts of the body, although changed in colour, retaining its smoothness. The contrast occasionally seen in this disease from black to a light-brown copper colour is very striking; sometimes little or none of the original colour of the skin remains, a few spots alone indicating its original hue. The

ulcers are at first often superficial, appearing as slight abrasions of the cuticle; but a closer inspection will detect a thin foul crust situated upon its edge. The voice, in some, becomes hoarse, and the throat is tinged with an erysipelatous blush. Should the skin recover its natural colour, the natives consider the disease as cured. It is not considered contagious by them, and they do not hesitate to eat from the same dish, and will even sleep on the same mat with persons afflicted with lepra or elephantiasis. They likewise assert that it cannot be communicated by coition, but they believe it to be hereditary. The wretched sufferers themselves invariably ascribe it to poison having been thrown upon, or secretly given them, by some witch whose displeasure they had incurred. The distemper, with all its loathsome evils, does not appear to shorten life, for they live a long time, and even attain old age. Lepers intermarry.

The natives are very subject to aphthous ulcerations of the mouth, and a spongy bleeding state of the gums, with looseness of the teeth. This appeared to me to depend upon the wide diffusion of land scurvy, aggravated by uniformity of diet, and the depressing influences of the unwholesome condition of their houses aiding the operation of a local miasma. Cases are not rare where there is much bodily wasting, with frequent bloody oozings from the gums, and gangrenous ulcers of the mouth and fauces, with petechial spots on the legs. The habit of taking snuff by the mouth, which is largely practised by both sexes, not only on the Gold Coast, but likewise at the Gambia and Sierra Leone, contributes to erode the gums, besides communicating an offensive odour to the breath. The snuff is placed between the gum and the lower lip, or cheeks, the ugly black ridge disfiguring the pretty faces of many of the black and coloured girls. From all these circumstances, it may be readily supposed that they suffer quite as much from toothache as Europeans.

The blacks are very subject to ulcerations of the feet, and few of them are free from the marks of former deep-seated ulcerations, either on the feet or legs. They manage their sores very badly, washing them far too much, thereby softening the granulations, and otherwise greatly retarding the healing process by their injudicious methods of sprinkling various powders over the face of the ulcer. They inject into sinuses astringent vegetable infusions.

The natives suffer severely from rheumatism, rheumatic swellings of the large joints, and anomalous fugitive pains, often brought on by careless exposure to chills, and their

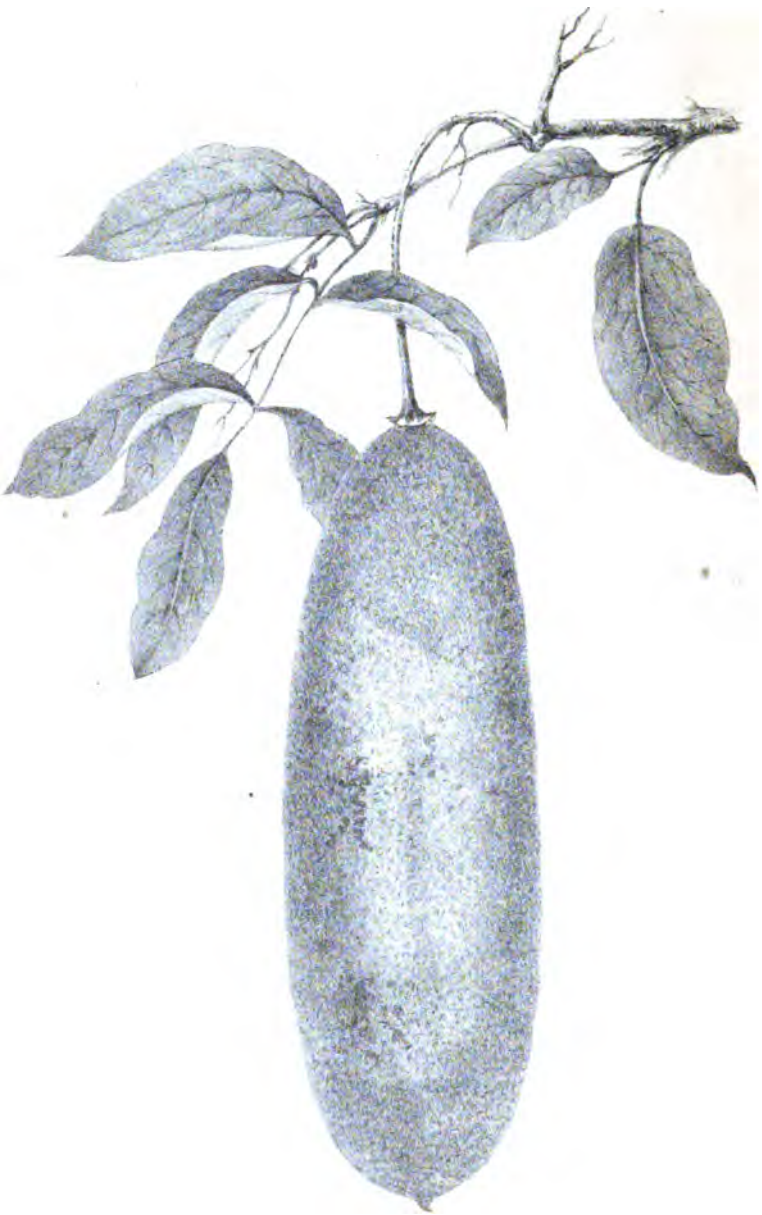
habit of sleeping on the damp earth, exposed in an unprotected state to the heavy night dews.

In treating intermittent fever they excite profuse sweating by placing the patient over a pot containing an infusion of the leaves of the castor oil, lime tree, and other plants, a large cotton cloth being thrown over the head, and reaching to the ground. The skin, after being carefully dried, is daubed over with a paste made of the sasmah or black pepper to induce perspiration. They likewise wash the body frequently with warm water. They now, however, appreciate the value of quinine, and invariably apply for and take it whenever they are within reach of procuring it.

Headaches often cause them inconvenience and distress, and their applications for ammonia to smell were constant. To cure it they put into the nostrils a small quantity of the paste of the "sasmah" pepper, and rub over the forehead a paste of the malagetta pepper. In fact, they suppose the fragrancy or pungency of all aromatic plants and perfumes are good for head affections. The dried leaves and powder of an odoriferous plant is much used as a perfume by the women, who wear it about their persons in small bags. It exhales a faint smell resembling new mown hay. The juice of the outer cuticle of the plantain tree is also used in headache, the face and head being bathed with it. Shaving the head is also practised to relieve obstinate headaches, and pounded leaves or red clay are then plastered over it. Cupping is much used in this complaint. A number of small incisions are made in the skin with a sharp knife, upon the temples, forehead, or as near as possible to the seat of pain, when the half of a small gourd is applied, the air being rarefied by burning a little cotton in it. Compressing the head tightly with a kerchief is also much resorted to.

I have observed that the mortality among the natives is greatest at the commencement and termination of the rainy season, and that hepatitis, icterus, diarrhœa, and dysentery, are then most prevalent, being then frequently brought on by eating new corn, ground nuts, cassada, and yams, before they are sufficiently dry. In some parts of the country the natives are interdicted by their rulers from eating yams before they are quite ripe, because they are unwholesome and dangerous articles of food until they arrive at maturity.

Both natives and Europeans suffer much from hepatic affections, and a great many of the former class were treated at the dispensary while suffering from jaundice, either inci-



THE FRUIT OF THE "ETHA" TREE,
OR
KIGLIA AFRICANA

pient or complete. Acute hepatitis is apt in this climate to run into abscess. To illustrate the rapidity with which this organ may be completely destroyed, I may mention that I was consulted during the year in the case of two European officers; the first, about twenty-seven years of age, was seized with rigor fever, and pain over the liver, with persistent constipation, and, in spite of the utmost attention, he died in nine days from the commencement of the attack. On examination, the liver was found broken down, and softened into a substance of the consistency of thick jam. In the second case, the officer might be about thirty-six years of age. He was first attacked with hæmorrhoids, to which he was occasionally subject, followed by diarrhœa, prostration of strength, and delirium, and sank soon after the first severe symptoms had set in. Examination after death showed that the liver was extensively burrowed by abscesses, and its substance infiltrated with pus.

Many of those who applied to me for assistance complained of griping pains in the bowels and stomach. To cure the griping pains they drink warm infusions of pepper and ginger, and compress the belly with a bandage.

Dysentery being by far the most fatal disease on the Gold Coast, both to the European and native, I shall take the liberty of saying a few words respecting its treatment. Some of the natives use an enema of a plant called by them "Tanta Annana," and restrict the diet to the flour of Indian corn which has been highly parched or roasted. A soup is eaten with it, made by boiling an infusion of the tanta leaf, scraped roasted plantains, and small pieces of dry fish, until it thickens. Should this mode of treatment fail, they use the bark of a tree called "Etua."* (See Plate.) The bark is boiled for two hours in fresh palm wine, and when cool is drank three times daily. Boiled rice as a dry diet is also strongly recommended. To relieve tenesmus they introduce into the bowels a suppository, made either of ground grains of paradise, or of the grains of a black pepper called "susmah," which is beaten up with the leaves of the plant called "Empoompoo." They also use for this purpose an enema made by expressing the juice of the plant called "yanchie" (a plant of the phormum genus), which they mix with a small quantity of the acetate of copper; but in the first instance, and during the cure, they purge the bowels with drastic medicines, and depend much upon enemata, given in small quantity, so as to be retained in the

* Kiglia Africana.

bowels, and upon great attention to diet. They are directed to keep themselves warm, and to rub the loins and belly over with a composition of grains of paradise and other peppers. The patients are allowed by some of the country doctors to wash their bodies with warm water, but, in general, pure water is forbidden, the skin being instead assiduously laved with a cold unstrained infusion made by macerating for one or more days the decayed roots of the plantain tree, with the leaves of the lime tree, cassada plant, and roots of the water lily, but in such case the skin is subsequently anointed with shea butter. After this some light food, generally a gruel called "pampa," made of Indian corn, is taken. In treating dysentery, they strongly recommend their patients to take cold air baths. They are directed to rise at daybreak, and sit naked in the open air, exposed to the cool and pleasant morning breeze, until six o'clock a.m. They are then washed in the infusion before described, have the skin well greased with the shea unguent, and partake of some "pampa" gruel, when they retire to rest, and frequently fall into a sound and refreshing sleep, often lasting many hours. This simple method of obtaining an air bath is likewise much practised to restore the health of invalids convalescing from other lingering illnesses besides dysentery. Persons while suffering from dysentery are not restricted from the use of meat, but the mass of the people being without the means of procuring it, they use dried fish as a substitute, which seems to answer equally well in persons not accustomed to animal food. Crab and crayfish are eaten roasted, but prohibited when boiled; beef is not objected to, provided it has been cooked the previous day; and the same rule applies to venison, and the flesh of the porcupine, elephant, and buffalo; indeed, many of the natives consider buffalo meat, not only as a safe article of diet, but even view it as a valuable curative agent. Mutton and pork, in any shape or form, are prohibited, as well as the flesh of the wild and domestic fowl. A cold infusion of the bark of a tree possessing the medical virtues of Winters bark, with the root, bark, and leaves of the boabob tree, is drank three or four times daily. The bark resembling Winters is procured from a tree growing in the inland districts of the settlements. It is rough, and of a brown colour. Sometimes the powder of these plants is given in cold water frequently during the day, and this powder is also mixed up with a small quantity of warm water, and administered as an enema at irregular intervals. Several of their medicines are given in palm oil, on the supposition that when mixed with water they become

inert. A great many other remedies are used in this disease, and I have merely given a meagre outline of the general principles applied by them to cure it. They consider dysentery highly contagious, and take care not to use the same convenience as the patient.

With regard to our medicines, they highly esteem castor oil in dysentery, diarrhœa, and other abdominal disorders, and prefer it and jalap as purgatives to any other in use in Europe.

It will be observed that the method of treatment adopted by the natives to cure dysentery differs widely from the European plan of treatment in one most important point, that of diet; for the natives direct that the patient's food shall be dry and nutritive, whereas the general rule of diet adopted by European medical officers is to confine the sufferer to soups and farinaceous substances, with an entire abstinence from solid animal food. This, in my opinion, is the secret of the great success attained by the natives in the cure of dysentery. With regard to animal food, I am quite satisfied that it is unwisely interdicted in the treatment of dysentery, more especially when it becomes chronic. It is difficult to draw the line of demarcation between diarrhœa and dysentery, where the one terminates and the other begins; but diarrhœa will sometimes last for months at a time without dysentery, and with no organic disease of the liver, proving fatal by its persistence and the debility and emaciation it induces. In dysentery no one remedy has been found, in European practice, on the Gold Coast much superior to another; but great benefit has been frequently derived by giving the acetate of lead and opium in chronic cases. When the stools are frothy and feculent, sulphate of copper has been found of the most advantage.

Having myself suffered severely from dysenteric diarrhœa, I may briefly state that I obtained the greatest relief from the painful and distressing tormini always more or less present from enemata composed of half a wineglassful of thin arrow-root, mixed up with a teaspoonful of tincture of opium, the bowels having been previously cleared out with castor-oil. This, combined with strict attention to a diet consisting of arrow-root and chicken-tea, was the chief treatment pursued, the strength being kept up with moderate quantities of port-wine. I need hardly observe that there must be an entire abstinence from food dressed with peppers, and from the varied sauces of the table, many persons having died of the consequences of indulging their appetites while convalescing from an attack of dysentery.

Dysentery is, then, the most fatal disease on the Gold Coast; but with ordinary care and attention, no apprehension need be entertained on the subject, provided medical aid is soon procured. Should the disease, however, persist, a removal to Europe is indispensably necessary to save life. An order from the military medical department was issued in 1856, directing the medical officers serving on the Gold Coast to send home, without loss of time, any officer who might be attacked with dysentery. With colonial European officers it is very different; and too often they delay leaving the coast until it is too late to do so, and death puts an end to their sufferings. The medical attendant may have urged his patient to leave when he saw his danger; but he can do no more than advise.

Syphilis, and all its sequelæ, are very prevalent among both sexes, and few of the males have the genital organs intact. In many, one or both testes will be found enlarged, or much diminished in volume, whilst others have the cords thickened and varicose; many have the inguinal glands permanently enlarged, and cicatrices from ulcerated bubo are frequent. The penis also often bears the marks of chancre; and its partial removal, or complete destruction, is no uncommon consequence of neglect and improper treatment. They are subject to œdematous swellings of the penis and scrotum, and to hæmorrhage from the penis and urethra requiring vigorous measures to repress it.

Gonorrhœa and gleety discharges are very common; and strictures and fistulæ of long standing are very common, and are constantly brought to the surgeon's notice. Cases of orchitis often occur, and hydrocele occasionally. They endeavour to cure hydrocele by vapour baths and topical applications of lime leaves.

Retention and incontinence of urine (especially the former) are common; but calculous disorders are almost unknown among the natives. In a case of incontinence of urine, in the person of a slave man, about thirty-six years of age, which had existed four years, I obtained a perfect cure by giving him a combination of alum and tincture of cantharides, in the proportion of forty grains of the former to two fluid drachms of the latter in twenty fluid ounces of water, of which I caused him to take half a wine glassful three times daily. I have deemed it right to mention the medicine so successfully prescribed in this instance, because I trust it may induce others to give it a fair trial in similar cases.

I have seldom noticed disease of the arterial tunics; but I

was frequently consulted for palpitation of the heart, and neuralgic pains of that organ.

Very severe injuries, as burns and gunshot wounds, were occasionally subjects of treatment. Persons, for example, when out shooting in the bush, sometimes fire at and wound or kill people by mistake; for, seeing and hearing the leaves of the copse rustling and moving, but unable to distinguish the object at which they have fired, they suppose these movements are caused by the game they are at the time pursuing. The natives of the Gold Coast, when in much trouble, often terminate their lives and miseries by blowing themselves up with gunpowder. A case of this kind occurred in 1857, where the father of a family fired a train of gunpowder, from the effects of which he perished, with his wife, two children, and sister-in-law.

Fractures and dislocations, the result of accident or violence, were just as numerous in proportion to the population as in any other colony. Dislocation of the lower jaw, I especially noticed, was of frequent occurrence both on the Gold Coast and at Sierra Leone.

A few persons who have suffered in early life from rachitis may be observed going about upon their hands, which are protected by wooden instruments; and the proportion of persons with distorted spine, which gives rise to the hunch-back, and also with talipes or club feet, are quite as often met with as in Europe. The native chiefs and kings are fond of having hunch-backed people about them as court-criers, to carry messages to short distances, and to amuse them with their buffoonery, grotesque appearance, and generally quick and witty remarks. On the death of a person whose spine is much hunched up, the natives cut away the hunch before they bury the body, because they believe, that if this were not done, other members of the deceased's family would become similarly deformed. In some parts of the country, the natives, on the death of a leper, burn the body, and also the clothes and mats he had used; but in other parts, lepers are interred in the nests raised by the white ant, and they do not make "custom" for them.

The number of children with large and protuberant bellies is remarkable; but it does not seem to arise from disease, but from being allowed to cram with food of difficult digestion, as, when they grow up, the enlargement disappears.

Exomphalos is very common, and arises either from cutting the chord too short, or from neglecting to bandage the umbilicus after birth. On certain days of the week, the natives rigidly abstain from labour. The fishermen, for instance, do not cast

their nets on Tuesdays, and Friday is sacredly held by some, while men in easy circumstances keep their birth-day as a holiday.

Stammering is a defect very common among the people; but it is affected by many among them, as it is considered *fashionable* to stammer. Persons with harelip, and tongue-tied infants, are quite as numerous as in Europe.

Malignant tumours are rare; but fibrous growths, and those of a steatomatous and ganglionic character come frequently under surgical treatment.

I was consulted by two persons who had been attacked with aphonia; they were both young people; one of them was a girl of eighteen years, who had been attacked five days before I saw her, but she made a good recovery.

I was frequently called upon to prescribe for young children suffering from swellings of the feet and legs, resembling anasarca, and proving fatal unless properly treated. The natives, to cure this complaint, wash the children with a variety of cold vegetable astringent infusions, and they likewise do the same to a child which is cachectic or emaciating. Very many of these children were slaves, who had been purchased from the Ashantees or Wassaws, and most of them were about three years of age. Judging from what has fallen under my observation at Cape Coast, I am of opinion that three hundred slaves are brought to that station every quarter from Coomassie and Wassaw.

The natives suffer occasionally from œdema of the face, and they view its appearance with great alarm, as it is a sure index of constitutional decay and disease of the liver. Persons affected in this way have a bloated, sickly aspect, with mental dejection and indifference to life. In this very fatal disease, the colour of the skin gradually alters from a black to a dirty whitish-brown or clay colour. The inside of the lips and tongue looks as it were blanched, and the gums become soft and pallid; the pulse becomes quick and small, accompanied with palpitations of the heart, and throbbing of the great vessels of the neck; respiration is easily hurried, and is often oppressed; the abdomen swells, the mesenteric glands are enlarged and hardened, and the extremities become anasarcous.

The negroes are subject to apoplectic attacks, sometimes brought on from excessive drinking; and epilepsy and chorea came occasionally under my notice.

Trismus infantium, or "the nine days' sick," as they call it, is common. If the child escape its influence until after the ninth day, they consider it safe.

Tetanus, either in its idiopathic or traumatic form, is by no means uncommon among the natives. Several persons applied for relief while suffering from an inability to separate one or both angles of the lower from the upper jaw. It is perfectly distinct from tetanus, as is readily shown by the expression of the countenance. It arises apparently from malarious influence. At all events, the muscles of the lower jaw are stiff, and cannot be moved by the patient's will.

Delirium tremens is, I regret to say, by no means rare among the natives; and I here record the great advantage which attended the use of chloroform in one of the worst cases of the disease which I ever witnessed. A European, about thirty years of age, had, before I saw him, passed several nights and days in the most distressing condition, haunted with the idea that he had been guilty of a fearful crime. In this lamentable plight, the powers of life being greatly exhausted, I suggested that chloroform should be tried. It was accordingly administered, but it failed in the first instance to induce sleep; nevertheless it soothed and calmed down the frightful mental alarm and apprehension, and a further and longer trial of it induced a most refreshing sleep, from which he awoke free from delirium. Everything went on well after this, and he made a rapid recovery.

A superficial observer might suppose, from the very few deranged or imbecile persons going about at large in the coast towns, that the inhabitants were seldom attacked by maniacal disease; but, from inquiries I have made on this subject, I am satisfied such is not the fact. Lunatics, it is true, are seldom seen in the coast towns, because their friends remove them into the bush as soon as possible after the maniacal paroxysm has been manifested; for the Fantees, Accras, and all the other races on the Gold Coast view madness with horror, and as bringing disgrace upon the afflicted party, his family, and friends. Suitable houses are therefore generally provided in the bush for the reception and medical treatment of the insane. In the neighbourhood of Accra, persons suffering from mania are sent to the town of Teshia, a few miles distant from Accra. With respect to the mode of treatment adopted by their doctors in these native asylums, the primary objects aimed at appear to be the security of the patients and the prevention of harm being done by them, either to themselves or others, during the maniacal paroxysms. With these objects in view, the patients are carefully secured by fastening the wrist to a log of wood by a staple, sufficient space being left between the log and staple to serve the purpose of a rude handcuff. If the

lunatic is very violent, the ankles are similarly fastened. In this condition they lie or sit on the ground, where they are often much neglected, being allowed to become dirty and extremely loathsome. On the first appearance of the disease, the head is shaved, when pounded leaves and other cooling applications are kept on it to reduce its temperature, and to calm down mental irritation.

The people of the coast are liable to a lethargy known among them as "the sleepy sickness." The drowsiness is so overpowering that the patient falls asleep even while eating. Young girls, in whom the catamenia has never appeared, or is suppressed, are frequently attacked with the disease. At Sierra Leone, I have known several instances of its being induced in youths of both sexes from smoking "Dianba," or Indian hemp.*

Attacks of coup de soleil are of rare occurrence. Indeed, it is a very common thing to see children secured to their mother's backs with the head exposed to the fierce glare and heat of noonday without suffering in the slightest. This immunity is owing, in a great measure, to the nature of their hair, and also to the relaxation of the system by which profuse perspiration follows the least exertion, thereby equalising the circulation, and preventing local congestions. Even Europeans are not subject to sun-stroke.

The powder of the Malagetta pepper is extensively used, and is applied externally in fever, rheumatic and fugitive pains. One way of applying it is by spitting the pepper from the mouth over the affected parts in a thin steamy shower. The pepper is also mixed into a paste, with water, and painted over the skin in longitudinal lines; but in Wassaw and elsewhere they daub it over the skin without taking that trouble. All the great joints are at the same time marked with a single spot of white chalk; and this observance is a custom which is practised only on the living; for the dead, although perfumed with Malagetta pepper and sweet-scented plants, are never chalked.

The native doctors entertain a firm belief that it is unsafe to give medicines after sunset, and abstain from doing so except on urgent occasions. They suppose that the body is then too weak to undergo their action, on the broad grounds that the sinking of the sun in the horizon is the universal signal

* See contributions by R. Clarke, Esq. on the "Treatment of Lithurgus", in the *London Medical Gazette* for September 1940, and *London and Edinburgh Monthly Journal of Medical Science* for April 1842.

for man to seek to recruit his health by repose, and that remedies then taken act injuriously instead of beneficially.

The natives of both sexes pay great attention to keep the skin clean, and generally wash their bodies twice daily, and when bathing, dry-scrub it with sand to remove impurities. I have frequently seen them lie down on the beach, and scrub themselves by rubbing the back against the sand; but they often assist one another to perform this salutary process.

They also scrub the soles of the feet clean by dancing backwards and forwards upon the sand; but all this care to preserve the skin clean does not extend to their clothing, which is only washed at uncertain intervals, and is frequently extremely dirty.

Accidents from the bites of snakes occasionally happen; and two instances have fallen under my notice. A slave, a young man about seventeen years of age, was bitten while working in the bush on the outer and middle third of the right leg. I saw him about an hour after the receipt of the injury, and found his friends had placed cords both above and below the wound, so as effectually to intercept the circulation. The pulse was very feeble, the skin cold and clammy, and, in a word, he was in a state of collapse. In these circumstances, I gave him a draught of aromatic spirits of ammonia and opium, and caused the wound to be diligently sucked, when I freely applied the nitrate of silver over its surface. His friends, having removed him, gave him an emetic, which caused him to vomit. He recovered in three weeks from the effect of the bite. In the other instance, a young Ashantee slave was bitten by a snake in the forearm, in the act of moving a heavy package, and some of his countrymen who were beside him at the time applied ligatures both above and below the wound, and at the same time freely scarified it with a razor, and then rubbed a lime, and applied powdered leaves over it, while others of them promptly killed the snake, and having extracted both the poison sacs, they mixed the venom with trade rum, and lime juice, and caused him to drink the mixture. Soon after he had taken the draught he vomited plentifully. There was very little swelling, and in a few days he was able to return to his usual avocations. In an infant bitten at Sierra Leone, in the right wrist, by a snake (the "cerastes"), and who died fifteen minutes after its infliction, I observed that the injured arm was greatly swollen, while the muscles were like freshly-killed beef. This was in remarkable contrast to the left arm, the muscles of which were pale and flaccid.

The treatment adopted by the Ashantees, in the case just referred to, resembles the homœopathic doctrine, as expressed in the axiom, *Similia similibus curantur.* The powdered bark and leaves of the cola tree, or its infusion, are considered by the natives of the Gold Coast an antidote for snake bites, provided one or other be promptly given to the sufferer.

Regarding guinea worm, I am satisfied that it is not caused by drinking impure water. The natives entertain an idea that the guinea worm prefers taking up its abode in the skin of those persons who have, as they express it, "sweet flesh," and that it avoids the skin of those in whom the perspiratory fluid is acid, the prevailing opinion among them being that the germ of the worm gets in some way into the skin; in what way they do not know. All the natives of the Gold Coast believe that there is a male and female guinea worm. The male worm is about the thickness of a crow's quill, the female being about the thickness of stout linen thread. There is no other perceptible difference, and they attain an equal length. Some of the people think it of more frequent occurrence during the rains, while others consider it quite as much so in the dry season. From a peculiar idiosyncracy, some persons are attacked by the worm every year, occasionally having several worms in various parts of the body at one and the same time. An individual may have at one and the same time a male and female guinea worm in the body, when two or three worms are present in it. The length of time that may elapse before the worm is extracted varies. Sometimes it will take six months, and if cut or broken two or three years; but should an abscess form, and ripen quickly, its expulsion is soon effected; but the average time may be reckoned at three months before it can be got rid of. They consider that the female worm is the most difficult to get rid of, and if either the male or female worm is broken, they believe that worms are produced from the fluid exuded from the divided parts. Children seven months old have frequently guinea worms, generally in their feet, legs, or arms. Many of the natives suppose the worms existed in their bodies before they were born; but it is well known that children, while their parents are suffering from the disease, come into the world without a trace of the worm, and grow up without getting it. Some persons continue subject to this cruel infliction during their lives, and aged persons are frequently afflicted with worms of each sex. I observed that when the troops and constables went into the rural districts, or along the seaboard, and had to remain there on duty for a week, or a longer time, that they generally returned with

guinea worm in their legs or feet, and this appeared to me to occur more frequently during the wet season of the year. To cure it, a cold poultice of "cankey," made of Indian corn, is applied over the blistered-like surface at which the worm appears; and if an abscess is present and points they open it either with a needle or a razor. A coarse powder is likewise made by pounding the leaves of certain plants, a portion of which they take into the mouth, and eject in the form of a thin jetty spray over the part. At other times this powder, which is of a yellowish white colour, is mixed up with water, and daubed over and around the opening through which the worm protrudes. Fresh chalots are also pounded, and fastened over it; and this application sometimes breaks up the worm, or causes it to be more readily extracted. They secure the worm with a thread, which they either wind round the part, or knot it, to prevent its retraction, and attach a small weight, as a piece of lead, to the free end of the packthread. Some persons wind it round a small piece of stick as it protrudes, doing this daily, or when the worm relaxes. No internal remedies are taken by them, but they spread palm oil over certain leaves, and apply them over the wound. In most instances the legs and feet are the seats of the disorder; the only part of the body which seems exempt from its invasion is the hairy scalp, and in that position it has never been seen. Several persons have been known to have thirty worms in their bodies at one and the same time. My friend, Surgeon-Major E. A. Brien, reporting last year (1858) on the prevalence of guinea worm, remarked that the men who slept on mats on the floor of the barrack-rooms of Cape Coast Castle were constantly attacked with it, but that upon beds and bedding being issued the disease gradually decreased. In the treatment of guinea worm, the iodide of potass has been found serviceable, given internally in doses of five grains three times daily. It appears to destroy the worm, and its germs, and to hasten its expulsion. Tincture of assafœtida has also been administered, with a similar intention, but I am doubtful of much good being derived from its use, both on account of its volatile qualities, and from its quickly passing through the kidneys. In opening abscesses I have frequently found two or three worms inextricably coiled together, an occurrence fortunate for the sufferer, as they are in that case speedily got rid of. The worst effect of guinea worm is that of occasionally inducing permanent deformity of one or both feet, when it takes up its seat in these parts, for it gets so twined about the tendo Achillis and tendons of the feet, and excites so much inflammation that they not unfrequently become permanently

flexed and contracted to such an extent that the person treads solely upon the cushion of the foot and toes, and walking is a work at once slow and difficult.

In Aquapim, and in some other districts, where water is abundant and good, in streams, wells, or springs, guinea worm is unknown, but when the inhabitants of this district visit the seaboard on business it frequently attacks them. Inland it is not found where there are running streams; but wherever the water is stagnant, and procured from the ponds before referred to, there the guinea worm is sure to prevail. Along the sea coast, from Appollonia to the Rio Volta, it prevails, and the people, as just stated, are often miserably maimed by it. On the opposite shore of the River Volta the people obtain tolerably good water by digging holes on the sea beach, often not three yards from the ocean, yet they are never attacked by guinea worm.

I have known several European officers and other whites have guinea worm in their feet or legs, or in other parts of their bodies; one of them having been attacked with it in one of his legs several months after he had returned to England.

I was called upon to attend several women in lingering and difficult labour during the past year 1858. I generally found an aged woman acting as midwife; but the patient was also cheered by the presence of numerous male and female friends, and although I readily induced them to leave the room, they returned to console her as soon as I had left the house. Parturition in the native woman has been generally represented as an easy process, and soon accomplished; but my observation is quite opposed to this opinion, for they suffer as much during child-birth as the female of civilised countries, and unfortunate cases have happened where the woman has died undelivered. Instrumental assistance is as often required; and some of the worst cases of laceration of the perineum, prolapsus uteri, and even laceration of the soft parts, to such an extent as to lay the vagina, bowel, and neck of the bladder into one common cloaca, fell under my notice in the course of my residence at Sierra Leone and the Gold Coast. The native midwives never think of supporting the perineum. They sit in front of the woman, another female placing both her hands against the patient's sides to support them. They do not support the back, because they suppose that if they did so, the child's eyesight would be injured. In slow and lingering labours, some of the midwives give a paste made of the tender roots of the Papua tree *(Carica Papya)* and the kernel of

the palm nut, fomenting the belly with decoctions of okro (*Hibiscus Esculentus*), and other mucilaginous plants. They also cause her to walk about the room. In difficult labour, she generally calls to her aid another woman of the same craft; and if delivery is still unaccomplished, the assistance of the surgeon is then requested. Should the placenta be detained, the patient is directed to retain her breath, or to blow strongly into a bottle, or into her hand. Sometimes they lave the abdomen with cold water to constringe the womb and cause the placenta to separate. Occasionally, they tickle the throat to excite vomiting and the desired uterine contraction.

Women dying undelivered, are buried in the sand beach; and in some of the remote parts of the country, their bodies are thrown into the bush, to become the prey of the jackal and other wild beasts.

Amenorrhœa, dysmenorrhœa, and leucorrhœa, are complaints just as common to the negress as European females; but hysteria rarely occurs among them. I have also met with ovarian enlargements, generally in women who had never borne a family.

Abortion is sometimes practised. In a case which occurred a few years ago, it was effected by introducing into the womb a piece of pointed stick upon which certain country medicines had been smeared, and thereafter administering a draught composed of the same drug. Labour came on in two hours, when she was delivered of a dead child. She died a month after. In another instance, a woman in a respectable position had become pregnant; and, dreading the loss of her appointment, she applied to a Fetish woman at Animaboe, who, after much persuasion, and a promise of a fee of £3 : 12, consented to her earnest entreaty, and administered a draught which immediately caused vomiting, succeeded by severe pains in the belly, when collapse came on, and she died six hours after taking the dose. The preparation used in the second instance to induce abortion was made from the leaves of the plant "*Emboo*," and the bark of the "*Cola*" tree. An enema was made by rubbing together and strongly expressing the juice of the leaves of the "Emboo" into about a pint of cold water, into which a small quantity of the powder of Cayenne pepper was put. This was administered about six o'clock A.M., and it soon after acted freely on the bowels. The woman then washed and anointed her skin, when a dose of the bark of the cola tree was given her. The bark was finely ground into powder, mixed with a wineglassful of lime-juice, and drunk off half-an hour after the injection had been

given. Sometimes the enema is repeated, and the cola powders also are given for two or three successive mornings, until the desired effect is produced.

Abortion is also sometimes resorted to when a woman who is suckling becomes pregnant, because of the injury done to the baby at the breast, and because generally they are too poor to rear the child upon spoon-meat.

Among the natives of the Gold Coast, a sterile woman is a reproach, and the birth of children is most earnestly desired; and several instances have come to my knowledge of well-educated natives consulting fetish practitioners to remove the cause of barrenness, by means of medicines and various charms —a consummation sometimes happily attained by a change of habits, but which is almost invariably ascribed to the power of the drugs of their country doctors.

A case of child-birth occurred in the colonial hospital in the early part of September 1858. The mother, an Ashantee refugee slave, was then delivered of a female child. Immediately after its birth, the skin was first carefully scraped with a knife, and afterwards scrubbed with dry sand, to remove the natural unctuous coating spread over it, when the infant was washed. These proceedings occupied an hour, and were performed in the open air.

During the whole period of my service in West Africa, no instance of hydrophobia occurred, although hundreds of half-starved mangy curs patrol the streets of the towns and villages on the Gold Coast, and at Sierra Leone.

Great difficulty is experienced in rearing European children. They, in general, thrive admirably until teething begins. It is at this epoch they are frequently harassed with intermittent fever, which, by repeated occurrence, causes enlargement of the spleen and functional disturbance of the stomach and bowels, when they soon become cachectic, and unless removed to a more genial climate, drop into an early grave.

Europeans some time on the coast are very liable to boils, which are very troublesome, appearing in crops upon the scalp, back of the neck, shoulders, and extremities. These inflamed indolent tumours vary in size from a small pea to a walnut; they suppurate slowly, and contain matter of a cheesy consistence.

With regard to health, strong opinions are generally entertained in Europe as to the insalubrity of the Gold Coast; but it is a well-known fact that many Europeans either forget or neglect the necessary precautions to preserve it, and frequently allow themselves to fall into excesses which the best constitu-

tions could not bear with impunity in Europe. The climate has been made the scapegoat of a thousand sins, and it has obtained a bad reputation, which, with all its faults, it certainly does not merit; the climate being quite as favourable, or even more so, than others in the same latitude, to European life and health. At all events, good health may generally be enjoyed by judicious attention to a few simple rules. In the foremost rank should be placed temperance, with regular and industrious habits. European residents on the Gold Coast are too often satisfied with wearing apparel suited to the climate, overlooking the fact that exercise in the open air is just as necessary to preserve health there, as it is in Europe. Many of them likewise entertain an impression that the sun's rays are hurtful, whereas, in nine cases out of ten, the mischief is done, not by the sun's rays, but by errors of *personal economy*. Feeling sadly the wearisome sameness of life upon this part of the coast, recourse is too frequently had to stimulants, instead of resorting to inexhausting employment, the only safe and effectual remedy against an evil fraught with such lamentable consequences. Europeans also bestow too little attention upon ventilation, far more harm being done by breathing close and impure air during the night than is ever brought about by exposure to the night wind. Indeed, there should be the freest circulation of air in the bed-chamber, and this may be always managed without subjecting the body to draughts. Out of doors the head should be protected from the sun by wearing either an umbrella over it, or by winding round a hat of light fabric a piece of white calico or red taffety, according to the pleasure of the wearer.

Great attention to keep the skin clean contributes much to preserve health in this climate, but the present scarcity of water prevents a bath, properly so called, being taken, the substitute being a careful washing of the skin on getting out of bed in the morning, which, however, answers very well. Some Europeans bathe in the sea, washing off the salt water thereafter, a practice also in use among the natives. It is hardly necessary to recommend retiring early to bed, say nine or ten o'clock, and rising early, say six o'clock, when a cup of tea or coffee should be taken. Indeed, it is not only a matter of choice, but of necessity, to get up early in the morning, as a great deal of business must in general be then dealt with, which cannot be postponed without loss of time to a later period of the day. The bed-room should be the largest and best-ventilated room in all the house, and during the "smokes," or foggy weather, fires should be burnt in it, to keep it dry and whole-

some. Piazza bed-rooms should be avoided. In my opinion, a very great deal of the suffering and disease constantly met with among Europeans in this climate is occasioned, as elsewhere, by over-feeding, which, as well as over-drinking, has consigned its victims to the graveyards of these settlements, sobriety as regards eating being quite as necessary to preserve health as temperance in drinking. A fair proportion of animal with vegetable food is as necessary to support and preserve the body in good health on the Gold Coast as in Europe; perhaps, even more so, because the powers of life are lowered by the influence of the climate. Good wine and bitter beer may be moderately partaken of, not only without harm, but with the advantage of fortifying the system. Above all, the mind should be kept cheerful, and as free from despondency as possible, with a firm reliance on the goodness of Providence; for nothing is more fatal to health and life in this climate than mental harass, and unfounded apprehensions of the climate. Formerly many officers in the English, Dutch, and Danish service, resided some fourteen, twenty, and thirty years in these settlements, and enjoyed good health, although those in subordinate positions had to undergo removal from one station to another. Besides, there is the fact, that for officers in the Dutch service the shortest term of remaining on the Gold Coast is six years, unless obliged to invalid before that period expires, and I understand that few of them require to return sooner to Europe to recruit their health. The annexed return of deaths which occurred in the Dutch service from 1st of January, 1851, until 31st of December, 1859, inclusive, will show that a large proportion died of disease not endemic to this part of the world. I may mention that this return was handed me by an officer of high rank, and that it is carefully compiled from the records of St. Jorge del Elmina. It is proper to state that the number of Dutch white officers serving on the Gold Coast generally averages 17.

In and about all the sea coast towns on the Windward coast walking is the only exercise that can be taken, as horses and other beasts of burden only live for a short time; but in the Leeward districts, where horses thrive admirably, equestrian exercise can be enjoyed, and health greatly improved by a daily ride over the fine pastoral country in the vicinity of Winnebah, Accra, Christianborgh Castle, and Pram Pram; and there cannot be a doubt that the advantages resulting to health from the face of the country being formed of vast undulating plains, covered with grass, wild flowers, and clumps of trees and copsewood, tells most favourably to European life,

when contrasted with the dense brushwood which generally prevails in the neighbourhood of the coast towns of the Windward districts. The country, however, about Elmina is for the most part more open and flat than that of Cape Coast, and horses generally live for a longer period at the former than at the latter station. A great deal of the land, however, lying to the west of Elmina, and in its immediate vicinity, is low and swampy, the ground being, moreover, broken up by naturally-formed ditches, into which the surface water drains during the rains. Elmina Fort is built upon the margin of the sea, and is situated at the embouchure of the river Byham, which admits vessels of light burthen, at high water, to load and unload under the walls of the castle. The apartments of the officers in the fort are, in general, much confined, the admission of air being, to a great extent, interrupted by the high walls which enclose them.

Notwithstanding the disadvantages just referred to, there might be many pleasant walks in the immediate vicinity of the towns in the Windward districts, if trouble were taken to keep the roads clear of bush; a benefit which could be attained at a trifling cost, but which would confer on the inhabitants the means of enjoying the healthful recreation of walking on roads unencumbered with weeds and unpolluted by filth.

In the time of sickness the want of female trained nurses is seriously felt by Europeans in these settlements. There are no nurses, strictly speaking. It is true that an aged woman, who understands English imperfectly, is sometimes got to look after the sick, but her attendance is considered rather as a favour, and she seldom remains beside the patient all night, as she generally then returns to her home, leaving the sick to be tended by male servants totally unqualified to undertake that duty. Should she, however, remain with the patient, her infirm health obliges her to lie down; and she, in fact, is of little use, except to get some soup or other article of food prepared. Numbers of the native women could, however, be found, who would gladly and cheerfully do all the numerous kind offices required by the sick, if they were not debarred by being unable to speak English. This inconvenience might be remedied by having two middle-aged women of good character as hospital nurses to tend the sick. Under proper management they would soon become familiar with their duties, and in case of sickness would be invaluable attendants upon the European officers and Europeans generally, when afflicted with disease of a dangerous nature; and from the well-known strong imitative qualities of the natives, there would soon be

enough of women found to act as nurses, provided they were liberally and fairly remunerated for their trouble. They should be compensated at a fixed rate, as unless this is done it would occasion much trouble both to the patients and to the nurses.

With regard to the classes best adapted to resist the climatorial influences of West Africa, the negro race, undoubtedly, hold the first rank; but it is questionable whether persons of colour are better able to bear up against its effects than persons of pure European blood, provided the latter are sober in their habits. There can be no doubt that Europeans upon their first arrival in West Africa are in greater danger of losing their lives than the former; but when once they have become acclimated they seem generally to withstand the influence of the climate better than the coloured people, provided, I repeat, that they are temperate in their habits.

In conclusion, it may be thought that I have dwelt too minutely on some of the subjects; but as a vast proportion of the diseases which afflict the population are, in my humble opinion, preventible, I dared not hang a drapery over naked facts, however unsightly, or conscientiously soften them down more than truth seemed to exact, my only object being to show how much may be done to improve the health of the people of the Gold Coast, and so mitigate human misery by removing evils the fruitful parents of disease and death.

TABLE

Showing the average Range of the Thermometer at Cape Coast Castle during the Year 1858.

	Remarks.	Max.	Min.
January	Harmattan wind throughout	84°	79°
February	1st week fine; 2nd, thunder and lightning. Heavy rain once	86	83
March	Mostly fine. Rain twice	85	83
April	Two tornadoes. Frequent rain	87	82
May	Two tornadoes. Heavy rain	85	75
June	One tornado. Frequent heavy rains	83	78
July	Uncertain, and light rains frequent	79	74
August	Overcast and mild. Slight rains. Latter part fine	79	74
September	Alternations of fine and rainy weather	81	77
October	Early part fine, then rain. One tornado. Latter part fine	84	79
November	Two tornadoes. Occasionally rain and westerly breezes	86	81
December	One tornado. Fine rains and moist. Westerly; fine and hazy	—	82

The thermometer suspended against the wall between windows looking south by east.

During the months of March, April, May, and June, the barometer ranged as follows :—29.90 in. to 30.05 in., or little more than the tenth of an inch.

There was no opportunity of observing the rise and fall of the barometer for the other months of the year, because the instrument from which those observations were taken did not arrive in these settlements until the middle of last February.

Prevailing Winds observed at Cape Coast during the Year.

December, January, February—The Harmattan, an east-north-east wind, and south-westerly winds. Land winds at night, varying west-by-north to north-north-west. Tornadoes occur in March.

April, May, June—In the early part of the morning north-westerly ; during the day south-westerly to westerly. Tornadoes in April.

July, August, September—Westerly and south-westerly winds. Land wind seldom blows during these months.

October, November, December—South-west breezes from the sea, with land winds from north-west.

The line of coast is generally washed by a terrific surf in the months of May, June, July, and August, but the ocean is often very rough for days together in March and the other months, boats and canoes being at such times prevented from putting to sea. While, however, the Harmattan wind prevails the sea is calm, and the industrious fishermen can at that season ply their vocation with safety, whereas at other times they are exposed to be overtaken by the storms and gusts of wind which are then so apt suddenly to appear in these latitudes.

Observations on the Etua Tree (Kiglia Africana).

The tree, called by the Fantees "Etua," is found growing in several districts of these settlements. It attains a height of eighteen feet or more. The fruit, which is, in its transverse section, of an oblate shape, hangs from the tree by a rounded cord-like stem, sixteen and a half inches long. The length of the fruit is sixteen and a half inches ; circumference, in the centre, eleven inches, and at the upper and lower ends ten and half inches ; while the diameter is three inches and three-fourths. A tough greenish brown rind, with dark spots, encloses the

fruit, which closely adheres to the cortex. A vertical section shows that the closely-grained nearly dried fleshy fruit is of a reddish brown colour, the seeds being imbedded in a fibrous and tenacious substance. In taste and flavour the fruit is strongly but not unpleasantly astringent; the rind less so; but the bark of the tree is strongly astringent; and I feel satisfied that the bark of the Etua tree will be found a medicine of great value in the treatment of diarrhœa and dysentery. The negroes esteem it as a sovereign cure for dysentery, and have done so for countless ages. On the Gold Coast the fruit is fetish, and is employed by the wily fetish men and women as a charm. When it is so used, the fresh fruit is painted in alternate stripes of red, white, and black. The colours are composed of ochre, chalk, and charcoal. Thus prepared, the fruit is transfixed to the earth, either in the pathways, house, or about the house of the party who consults the fetish man or woman, as may be directed. Sometimes the fruit is painted entirely black, and then dotted all over with red and white spots, when it is used in a similar manner. The ceremony is an invocation to the fetish to discover the remedy which is suitable to cure the disease of the person seeking advice from the fetish man or woman.

Return of the Causes of Death of Twelve Officers in the Dutch Service upon the Gold Coast in the eight years from 1*st January*, 1851, *to* 31*st December*, 1859, *inclusive.*

Disease.	Period of Service.	Remarks.
Phthisis Pul.	3 years	
Inflammation of stomach	18 „	
Dysentery	4 „	
Dropsy	14 „	
Constipation	4 „	
Dysentery	13 „	
Dysentery	3 „	
Rheumatism	3 „	
Arthritis	12 „	
Suicide	4 months	
Fever (Cerebral)	3 „	
Rheumatic fever	6 „	Died before med. aid arrived

EPIDEMIOLOGICAL SOCIETY.

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Monday, November 5, 1860.

THE Eleventh Session of the Epidemiological Society was opened by Dr. Babington, the President, who, on the occasion, addressed the meeting as follows:—

GENTLEMEN,—We are now assembling for the eleventh session since our foundation, and I will venture to affirm that during the ten years that we have,—unobtrusively indeed, with moderate numbers, and with slender means at our disposal, devoted to the investigation of epidemic diseases, and to subjects connected with them, we have by no means laboured in vain. We were first in the field, and it is gratifying to know that we have been followed by more than one body having the same objects as ourselves, and that we have been otherwise instrumental in directing general attention to a class of diseases so extensively prevalent, so destructive, and let me add, in many cases so preventable.

Gentlemen, the report which I am about to read to you, so ably drawn up by Dr. McWilliam, our Secretary, is necessarily so long, that I will only occupy you a few moments longer by adverting to the great loss we have sustained since we last met, in the death of two of our most distinguished members. The late Director General of the Medical Department of the Army (Mr. Alexander) was a man who, while he most efficiently and strictly performed his onerous duties, and manifested great talent in his administration, yet conciliated the good opinion of all who were brought in contact with him by the frankness

of his manners, and the amiability of his disposition. The removal of such a man is a public calamity.

The sad end of our late Treasurer, Dr. Addison, has been a source of deep affliction to his numerous friends, to whom he was endeared by his uprightness and honour; and the profession at large has sustained a loss in his death which will not readily be repaired. To great talents for observation, he added indefatigable zeal and industry in the study of pathology, and the result was unrivalled skill in diagnosis, and a discovery which will hand his name down with honour to a late posterity.

The following Papers have been read during the past session:

On Monday, Nov. 7, 1859.—A Paper "On the Theory of Zymosis," by Dr. Richardson, was read by the Author.

On Monday, December 5th, 1859.—The "Report of the Diphtheria Sub-Committee," was read by J. N. Radcliffe, Esq., the Secretary of the Sub-Committee.

On Monday, January 2nd, 1860.—A Paper entitled, "Suggestions for Utilizing the Statistics of Disease among the Poor," by Dr. Milroy, was read by the author.

On Monday, Feb. 6th.—A Paper "On Quarantine in the East," by Dr. Foote, of Constantinople, was read by Dr. McWilliam.

On Monday, March 5th.—"A Paper on the Disinfecting Power of Heat," by a Committee of the York Medical Society, was read by Dr. McWilliam.

On Monday, April 2nd.—I. "On Cholera at Guildford in 1854, illustrated by a map of that town," by H. H. Taylor, Esq.; and II. "On Cholera at Wick," by Dr. Banks, was read by Dr. McWilliam.

On Monday, May 7th.—A Paper "On the Topography and Diseases of the Gold Coast, West Coast of Africa," by Robert Clarke, Esq., was read by Dr. McWilliam.

On Monday, June 4th.—A Paper entitled "Suggestions for a better Method of observing Epidemics," by J. N. Radcliffe, Esq., was read by the author.

On Monday, July 2nd.—A Paper "On Cholera at Scutari in 1855," by Dr. Fraser, Physician to the London Hospital, was read by Dr. McWilliam.

HEALTH OF ENGLAND.

In this country, during the latter months of the last year, and the first quarter of the present year, the mortality was slightly above the average, but below the rates of the corresponding periods of the two previous years.

In the quarter ended June 30th, bad weather and dear food produced a higher death-rate, with only two exceptions, than in any corresponding quarter of the previous ten years. During the succeeding quarter, however, the mortality was relatively very low, the deaths even among the increased population having been 3094 less than in the same quarter of 1859. The low temperature and copious rainfall by which this quarter was marked, checked the progress of diarrhœa, and other disorders which are prone to assume the epidemic form at this season.

Diphtheria has very greatly declined, and in other respects the year has been singularly free from epidemics. We appear, in fact, to have passed through one of those cyclical epidemic periods which now and then recur, and to be entering upon a period of remission.

CHOLERA. In the address delivered at the opening meeting of last Session, it was stated that cholera had broken out in the course of the summer of 1859 at Bombay and Poonah, and almost simultaneously in Europe, where, commencing at Hamburgh, and afterwards extending to the various countries of the Baltic, and later to the coast of Holland, it still rested on the Mediterranean seaboard of Spain, and was devastating the Moorish as well as the Spanish troops in Morocco.

Since that time cholera appears to have been wide-spread and fatal in many parts of India. Among other victims, we have to deplore the loss from this scourge of a most distinguished public servant, Sir Henry Ward, who had only recently assumed the government of Madras.

In the latter part of last year a most severe outbreak occurred in some districts along the line of the Great Central Railway of India, among the native labourers engaged in its construction. The details (which were communicated by the engineer on the spot to the company) are highly interesting and worthy of notice, as showing how much the success of commercial and industrial enterprises, no less than the success of military and naval operations, may be seriously influenced by the prevalence of epidemic diseases. The districts which suffered most severely were the central and north Rajmahal divisions of the line of country in the valley of the Ganges between Calcutta and Patna; and the period when the pestilence was most deadly was the last third of October, and the whole of November.

"The labourers," says Mr. Roberts, "among whom the epidemic first appeared, and who were its principal victims, came chiefly from the Burdwan and Bancoorah districts. The first large body arrived in the middle of October, and having been exposed on their journey to the heavy rains, and having had to travel over a country partially inundated, with no shelter at night, they were, on their arrival, in a condition to fall easy victims to such a disease as cholera. Large masses of men continuing to arrive almost daily, the utmost exertions of the engineers failed to get together materials for at once hutting them, and a large proportion had no shelter whatever for many days, while cholera was raging among them.

"The disease broke out in several localities about the same time, and among the same class of people, viz., coolies and brickmakers, recently arrived. The coolies were frequently removed from the localities they had chosen to healthier spots, but with little benefit; and the medicines distributed among them seldom checked the malady—death rapidly supervening upon the attack.

"When the disease was at its height, the mortality in the central division *in the course of one week* averaged not less than ten per cent. of the strength; and at Heenen Kohl, in the north division, the same terrible proportion perished. In one

locality nearly an eighth part of the labourers were swept off within one week. The total number of deaths was estimated at upwards of 4000. The numbers of dead bodies lying exposed along the roads and around the locations of the coolies were enormous, and the consequent stench was most sickening. The Bengalee coolies always abandoned their dead, and too often their sick also. The engineers had great difficulty in getting persons to remove the bodies into the jungles. During this dreadful mortality among the poor labouring coolies, only a few natives of the better class (Sirdars, Writers, etc.) fell victims to the disease, and no Europeans were even attacked."

These circumstances are most significant, and, as in the analogous exemption of officers in our army and navy, on many occasions, while the privates and seamen have suffered severely, ought to command our serious attention. The congregation of masses of men, more especially after exposure to fatigue and inclement weather, has but too often been followed with results alike disastrous, as those just recorded.

By a report from Acting Deputy Inspector Inglis, dated at Poonah, August 23rd, 1860, it appears that cholera broke out among the 33rd Foot, at Deesa, on the 3rd July, but did not for some time assume an epidemic form. On the 17th of July, however, the prevalence of the malady became so formidable, that it was necessary to move the regiment from its lines into camp, a measure which at first had not the effect of arresting the progress of the disorder. In a large proportion of the cases, the symptoms were extreme, and the termination fatal, more especially among the young men. Up to the 15th August, when the disease was abating, there had been in the 33rd regiment thirty-five cases of cholera, of which nineteen had proved fatal. The drains and cesspools were said to be in bad condition, and had been forcibly animadverted upon by the surgeon of the regiment.

Sporadic cases of cholera occurred about the same time among the 95th Foot, and $\frac{6}{13}$ Battery, Royal Artillery, at Neumuch.

According to Dr. Inglis, the tendency to choleraic disease at those stations which are at a considerable distance from the sea coast, depends much upon meteorological influences. The want of an abundant fall of rain, which at this season has the effect of removing atmospherical impurities, and cleansing the surface, having been much felt all over the interior during the summer of 1859.

During the month of July, also, the soldiers' families at Chinsurah depôt suffered much from cholera of a malignant type; and although early in August the cases had diminished in number and intensity, the disease still lingered there.

The first admission took place on July 3rd, and the cases were for some time solely among the women and children that had arrived from England by the "Accrington." It soon, however, extended itself to the others. The barracks hospital and cantonment had ample space, and to spare, for their occupants. The drainage having been alleged to be defective, was at once attended to, and put in order.

In the latter part of July, cholera broke out with particular virulence at Morar, Gwalior, where H.M. 71st Highland Light Infantry, and the 5th battalion, 11th brigade Royal Artillery were stationed. Dr. Simpson of the 71st regiment reported the first appearance of the disease, on the 23rd July, when several cases occurred within twenty-four hours, and ten in the course of the following week, with six deaths. From the 30th July to the 5th August there were twenty-six admissions with twelve deaths; and between the 6th and 12th of August, forty-six admissions and twenty-four deaths. By last accounts, when the disease was abating, the number of deaths in the regiment from cholera amounted to forty-two. No cause could be assigned for the outbreak. Simultaneously with its appearance in the 71st regiment, cholera also visited the Royal Artillery, quartered with them. Up to the 13th of August the casualties amounted to twelve men.

At Jhansi a fatal case of cholera occurred on the 3rd of August. The cases that followed, although of a very malignant character, were fortunately not numerous. Cholera was

also reported among the Rifle Brigade stationed at Agra, on the 6th August; but by accounts lately received the disease had ceased by the 16th of the same month.

CHOLERA AT MAURITIUS. Cholera appeared at the Mauritius on the 19th September, 1859, and the disease, although much more limited in its range, was proportionate to the number of cases, equal in virulence of type, and in mortality, to any of the former epidemics of this malady by which the island has been visited.

The disease commenced in the district of "Plaines Wilhelms," situated about seven miles from Port Louis, the capital of the island, and prevailed in the estates there epidemically for a fortnight; and from thence, following the course of a canal to Petite Rivière, it reached Black River Bridge, which is within two miles and a half of Port Louis, on the 8th of October. Here the disorder continued until the 24th November. The disease entered the capital, but the conditions for its propagation were not present, as there did not occur more than from twenty to twenty-five cases. At Grand River, however, which is within the municipality of Port Louis, 149 deaths were recorded.

At Grand River there are two important aggregations of people, viz., in the lunatic asylum, and at a place called the Camp Benoit, which consists of a large assemblage of badly built and badly ventilated huts inhabited by Indians. The results of various visitations of cholera in this district are eminently characteristic of the capricious nature of this malady. In the cholera epidemic of 1854 nearly half the female inmates of the asylum perished; while the Camp Benoit, the sanitary condition of which was bad, was the only place that escaped. In the epidemic of 1856 the whole of the neighbourhood continued exempt from the disease, not a single case of diarrhœa even having occurred on that occasion in the asylum. During the epidemic of 1859, however, the whole locality, including the asylum and Camp Benoit, suffered severely. The immunity of this place at one time, and its invasion at another, are not to be accounted for on any sanitary principle, as in this

respect there was not on any of the occasions in question the slightest difference of condition.

On the 11th of October the disease broke out at Rivière du Rempart, about eighteen miles from Grand River, on the "Poudre d'Or" estate, and soon afterwards in the adjoining village of Poudre d'Or. From the 24th November to the 15th December the island was totally free from cholera. On the latter date the disorder declared itself on the estate of Beauchamp, and afterwards on the Beau Rivage estate, in the district of Flacq. By the end of February the disease had disappeared from the island.

The points of interest in the cholera epidemics at the Mauritius, alluded to in the report of Dr. Clerihew, appear to be—

I. The limited range of the disease during the epidemic of 1859-60 compared with that of former cholera visitations in Mauritius.

II. The complete cessation of the disorder on November 24th, and its reappearance in three weeks afterwards.

III. The exemption from the disease, during the epidemy of 1854, of the Camp Benoit, notwithstanding its eminent sanitary defects, while the asylum, as being under discipline, and presumptively in good order, suffered severely.

IV. The immunity alike of the asylum and the Camp Benoit, without (as is expressly stated) any improvement in sanitary state, during the epidemy of 1856.

And V. The circumstance that the Camp Benoit and the asylum were the chief seats of the disorder during the epidemy of 1859-60.

Cholera appears to have pursued relentlessly the Spanish army during the whole of the campaign in Morocco. The scourge may indeed be said to have never been absent from that army, from the time that the various forces of which it was composed began to assemble last year at Malaga, San Roque, and Algesiras, previous to their embarkation for Africa.

In Morocco it proved, alike to the invaders and invaded, far more destructive than the sword. The losses of the Moors are not likely to be ever made known; but of the entire losses by

the Spaniards from all causes, estimated at between 15,000 and 20,000 men, three-fourths at least were due to disease, and mainly to cholera. Ceuta and Tetuan both suffered with unusual severity.

Whether the disease was introduced into Morocco by the Spaniards is not quite clear, as a French expeditionary force on the eastern frontiers of Morocco was more than decimated by the pestilence in the course of a few weeks, about the end of October and beginning of November.

There was by all accounts great neglect of sanitary precautions both in the Moorish and Spanish camps. The burial of the dead, and of the carcases of animals, was little attended to; and in the early part of the campaign, especially, the supplies of food for the Spanish troops were irregular, and insufficient.

Dr. Julius Williams, medical superintendent of convicts at Gibraltar, after alluding to outbreaks of cholera in Spain previous to last year, says—"Little however was said about the disease until the arrival of the Spanish army last autumn in San Roque, Algesiras, Malaga, and other ports, at all of which it soon began to prevail epidemically. When the dirty character of these towns is considered, it is not to be wondered that cholera should have so soon assumed the epidemic form among bodies of troops, ill-fed, indifferently clothed, and billeted over the worst of the undrained and badly ventilated districts."

During the whole of last summer, and almost indeed up to the present time, cholera has elected as its seat one or more of the Spanish sea-ports, and sometimes an inland town. A quarantine of observation was instituted by the government at Palma in Majorca.

According to the recent notifications of the ever-vigilant Lisbon Board of Health, all the Spanish ports except Valentia are free from cholera infection; and Tangier, and the other ports of Morocco, are still declared as infected with that disorder, as are also Oran, and some others of the Algerine ports.

Cholera has of late broken out at Gibraltar. The first cases appeared in the second week of August; the disease had

just before been prevailing at Algesiras, and in the Spanish lines adjoining the neutral ground, between the Rock and Spain.

YELLOW FEVER. From Deputy Inspector General Robert Lawson we learn that the public health of Jamaica during the past year has been good. Cases of fever of the yellow variety, many of them of a severe description, occurred occasionally; but the disease at no time prevailed to any extent.

The stations of Nassau, and Honduras, were equally healthy until the middle of July last, when yellow fever in a malignant form broke out at Belize, and in a short time decimated the white population, more especially the new comers. The coloured people and the old acclimated whites nearly all escaped, as did also the troops, all of whom, with the exception of the officers, were black. An army assistant-surgeon had fallen a victim to the pestilence.

The weather had been bad, and of an unusual kind; rain having fallen plentifully during each month of the dry season, and in June, when there is usually heavy rains, the weather was dry and hot with only occasional showers.

From the island of St. Thomas, we learn that, compared with other years, the mortality during the past year has not been large. The long prevalence of yellow fever at this island has been attributed to a variety of causes, among which are—importation by the steam vessels from Navy Bay, on the mainland of the South American continent; miasmata from the large stock of coal on board ship and ashore; and impurities in the water of the harbour. Acting upon the last-named view, the Danish authorities had resolved to cut a canal to the westward of the harbour, so as to create a current to the open sea, and thus draw off the foul water from the harbour to the ocean.

Fever of a mild character appeared among the troops stationed at Hamilton, Bermuda, in the course of last summer; but it ceased when they were removed to an elevated spot called Prospect Hill.

Most of the parts on the coast of Brazil have been visited by yellow fever during the last twelve months. A curious and

instructive case in the history of this disease occurred at Lisbon, at the commencement of the present year.

A sailing vessel, the "Cidade de Belem," arrived at Lisbon from Para in Brazil, on the 31st December, 1859, after a passage of thirty-eight days. Yellow fever was prevalent at Para while the "Cidade de Belem" was there, and eight days previous to her departure from that port two of her seamen fell victims to this scourge. The crew were in perfect health during the voyage, and on their arrival at Lisbon, on the 2nd January, 1860, or three days after the ship's arrival, the hatches were opened for the purpose of discharging the cargo, when all hands, including a pilot and health guard officer (both sent on board at Lisbon), were attacked with nausea and other unpleasant symptoms. The cook at once manifested grave symptoms of yellow fever, and he died on board on the 4th January. The health officer was attacked the next, a seaman on the 6th, and another seaman on the day following. Both seamen died at the lazaretto on the 18th January; and the health guard, after being in extreme danger, recovered.

Every precaution was taken with this vessel in enforcing strict quarantine measures on her arrival at Lisbon. The cargo, consisting of hides and other susceptible articles, was landed at the lazaretto and there burnt. The vessel was towed off the coast on the 14th January, by a man of war steamer, and ordered to proceed to Vigo, which port she reached on the 22nd; and after performing a quarantine of fifteen days, she was there admitted to pratique, and then returned to Lisbon, where, however, she was again placed in quarantine, and shipped a cargo for Brazils, under the usual restrictions of that condition.

Here we have a ship leaving a port infected with yellow fever, with her crew healthy, and maintaining good health during a long passage; and at the end of forty-one days, the disease which prevailed at the port of departure breaking out on board, attacking not only the crew, but also two persons recently come on board at her port of arrival.

Yellow fever has also recently broken out at McCarthy's Island in the Gambia, and besides other victims, not less than three army assistant surgeons had been carried off by it.

The epidemic of small-pox, to which allusion was made in the last annual address as present in London, continued afterwards to increase in severity and extent.

During the last quarter of 1859, the deaths from this cause exceeded by more than one-half the deaths of the quarter preceding, and the disease extended to portions of the metropolis (comprising the parishes in the western, northern, and west-central districts) which had till that time been comparatively little affected, or wholly exempt. To arrest as far as possible this further extension, the government determined at this period to communicate specially with the local authorities of each parish, warning them of the danger impending, and urging them to secure the protection of the inhabitants by timely vaccination. Towards the end of the year, our colleague Dr. Seaton was desired by the Lords of the Privy Council to visit for this purpose the respective boards of guardians, and to concert with the medical officers of health and public vaccinators the measures which might be required. The full details of the steps taken, and their result, have not as yet appeared. But it can safely be asserted that the measures adopted, although differently carried out in different unions, were generally of a very active kind. Notices were everywhere issued, warning the public of the danger run, and the penalty incurred by the neglect of vaccination; the national and charitable schools were visited by the medical officers of health, or under their direction, and means were taken for protecting, as soon as possible, all children found unvaccinated, or whose vaccination appeared doubtful or insufficient: inquiries as to vaccination were instituted in the birth registers, or from house to house; and in some localities a complete system of house to house visitation was carried out. The immediate result was a rapid and remarkable extension of vaccination, and a very sensible impression on the small-pox mortality; and we may without hesitation attribute to this

timely and extended vaccination the comparatively slight degree to which the portions of London referred to have suffered from this severe epidemic visitation. The disease is at length rapidly on the decline throughout the metropolis; the deaths from it in the last three quarters having been 464, 240, and 99 respectively. But it is lamentable to have to state, that from the commencement of the epidemic towards the close of 1858 to the present time, nearly 2,000 persons have fallen victims in the metropolis alone.

SMALL POX still continues fatally prevalent in many portions of the kingdom. It has been reported in the course of the present year as prevailing in Devonshire, Berkshire, Hertfordshire, Cambridgeshire, Northamptonshire, Norfolk, Lincolnshire, Nottinghamshire, Cheshire, Lancashire, Durham, and in parts of Wales.

During the present epidemic period there have been observed, both in London and in England generally, many cases of second attacks of small-pox, and many in persons believed to be protected by vaccination. But where the evidences of vaccination were complete and sufficient, the disease assumed almost always a modified form, was rarely confluent, still more rarely fatal; while on the other hand, there was a large number of confluent cases, and many deaths, in persons in whom the cicatrices of vaccination were insufficient or imperfect.

The perfect performance of vaccination is a point to which too much attention cannot be given, but to which it is to be feared too little has hitherto been paid. One cannot but rejoice, that by recent regulations, no one who was not qualified as a medical practitioner previous to the issue of them will be allowed in future to take upon himself the office of public vaccinator without having attended for instruction or examination the vaccinating stations designated for the purpose by the National Vaccine establishment; and that public vaccinators are now required to vaccinate according to definite instructions, which have been issued under powers conferred by Act of Parliament on the Lords of the Council, and were drawn up by their lordships' medical officer in consultation

with persons eminent in the subject, and especially with Mr. Ceely of Aylesbury, and our colleague, Mr. Marson—the two highest living authorities on vaccination in this country.

It is indeed much to be regretted that to this important step the government did not add, during the past session, an amendment of the present most imperfect compulsory law. The severe mortality of this epidemic, not in London only, but throughout England, shows how much this amendment is needed.

Small-pox continues to prevail in various districts of the Cape of Good Hope, more especially on the frontier of that colony.

In November, last year, small-pox was introduced into the military hospital at Gibraltar by two seamen from H.M.S. "James Watt," but, from the precautions taken, the disease spread to a limited extent only. The disease was at the same time prevalent on board the French frigate "L'Impératrice Eugénie," when she was despatched by Admiral Delafosse to Toulon.

STEPPE MURRAIN. In December a royal ordinance prohibited the importation of cattle into Saxony by the Bohemian frontier on account of the prevalence of the "Rinderpest" among the cattle brought into Silesia and Bohemia from Podolia and Gallicia. Early in February the disease declared itself in Moldavia, causing great havoc.

The disease, which was fatal to 95 per cent. of the cattle attacked by it, was supposed to have been introduced into Germany by contagion from the Russian steppes in the east of Europe. Measures were also taken by the authorities at Warsaw to prevent the spread of the disease from Gallicia into the adjacent districts of Poland. The consul at Jassy says—"It is generally observed that diseases of any kind, together with locusts and other plagues, come into Moldavia from Bessarabia; and this is said to be on account of the scantiness of the population of that province to cope with such enemies. The cattle owners take great pains to isolate and slaughter the diseased cattle, and bury their carcases deep in the ground, precautions which have the effect of limiting the spread of the disorder."

QUARANTINE. The secretary of the Quarantine Committee of the National Association for the Promotion of Social Science, our colleague, Dr. Milroy, has received voluminous replies to the queries drawn up by the Committee, and transmitted by Her Majesty's government to the consuls abroad, and to the governors of H.M. colonies.

From the information thus obtained, two most elaborate and important documents have been prepared by the secretary; the one is entitled, "Copy of Abstract of Regulations in force in Foreign Countries respecting Quarantine, communicated to the Board of Trade," and the other, "Abstracts of Returns of Information on the Laws of Quarantine," which have been obtained by the Board of Trade. These documents, which have been printed and presented to parliament by royal command, contain a large amount of most valuable information on the subject to which they refer. At the recent meeting of the Association for the Promotion of Social Science held at Glasgow, Lord Brougham alluded to the operations of the Sub-Committee on Quarantine in his inaugural address. At the same congress, several important papers on sanitary questions were read and discussed in the section devoted to that purpose.

At the meeting of the International Statistical Congress held in London in July last, several important sanitary questions were discussed in Section No. II: among which may be mentioned, "Proposals for Uniform Hospital Statistics," by Miss Nightingale; "Proposals for a Uniform Scheme of Sanitary Statistics," by Dr. Sutherland; and "Propositions on General Sanitary Statistics," by Dr. Farr. Dr. Milroy read a paper on the "International Registration of Epidemics." A paper on "Wet Nursing," by Mrs. Baines, was also read. A proposition, by Professor Symonds, "that means be adopted for ascertaining the extent and fatality of epizootic and other diseases, among animals which are ordinarily used as food," and a proposition by Dr. McWilliam, "to investigate the mortality in the mercantile marines of the various countries represented in the Congress," were adopted.

NOTICES OF THE APPEARANCE OF SYPHILIS IN SCOTLAND, IN THE LAST YEARS OF THE FIFTEENTH CENTURY.

By J. Y. SIMPSON, M.D., F.R.S.E., Professor of Medicine and Midwifery in the University of Edinburgh.

Read Nov. 5, 1860.

PART I.—DATA.

MEDICAL men are, for the most part, agreed upon two points in relation to the history of syphilis; viz., that it is a species of disease which was unknown to the Greek, Roman, and Arabian physicians; and that it first began to prevail in Europe in the later years of the fifteenth century.

The non-existence of syphilis in ancient times, and the circumstance of its original appearance in Europe about the date alluded to, are opinions strongly borne out by two sets of facts. For, *first*, no definite account of this marked and extraordinary species of disease is to be found in the writings of any one of the ancient Greek or Roman physicians, historians, or poets; and, *secondly*, of the numerous authors whose works exist in the learned collections of Luisinus,* Astruc,† and Girtanner,‡ and who saw and described the malady in the latter years of the fifteenth or commencement of the sixteenth century, almost all comment upon it as (to use their own general expressions) *morbus novus, morbus ignotus, ægritudo inaudita*, etc., etc.

It would not, however, affect our present object were we to consider the disease, as it appeared about the period in question, not to have been a new malady previously totally unknown, but merely, as some have thought, an aggravated form of a disease formerly existing in so mild a form as not to have attracted general observation.

I do not stop here to inquire into the much more difficult questions of the probable source of the disease, and the exact date at which syphilis first burst forth in Europe. In relation to the object which I have at present in view, it matters not whether the malady sprung up spontaneously and endemically

* Aphrodisiacus, sive, Collectio Auctorum de Lue Venerea. Venet., 1566. 67; and Lugd. Batav., 1728.

† De Morbis Venereis. Paris, 1740.

‡ Abhandlung über die Venerischen Krankheiten. Göttingen, 1788.

in Spain, Italy, or France, at the era in question; or was imported from Africa, as Grümer,* Infessura,† and others allege; or from Hispaniola, as Astruc,‡ Girtanner,§ Weatherhead,‖ and various other authorities have stoutly and not unsuccessfully maintained. Nor is it necessary for me to discuss whether it first shewed itself in 1493, as Sanchez¶ and Hensler** consider that they have proved; or in 1492, as Fulgosi†† asserts; or as early even as the month of October 1483, as Peter Pinctor,‡‡ in 1500, demonstrated astrologically to his own complete satisfaction at least, that it ought to have done, inasmuch as that was—as he sagaciously convinced himself—the precise and exact date of the conjunction of Venus with Jupiter, Mars, and Mercury; and the conjunction of these or other stars in the heavens above, was—so he and many of the astrological physicians of his day believed—the undoubted origin of this new scourge on the earth below.

In such a notice as the present, we may most safely, I believe, and that without entertaining the question of the exact source or geographical origin of syphilis, start from the general proposition that the disease was in 1494 and 1495 first distinctly recognised in Italy, during the invasion of that country by the victorious army of Charles VIII of France. The malady is usually allowed to have earliest broken out in a marked degree at Naples, about the time that Charles took possession of that city, in the spring of 1495; or nearly two years after Columbus' return from his first voyage to Hispaniola. Charles set out again for France in May 1495; and the malady seems to have been both diffused by his infected troops along the line of their northward march, and afterwards carried to their respective homes by his own French soldiers, as well as by his various Swiss, German, and Flemish auxiliaries.

But it is as little my intention at present to trace the progress as to ascertain the first origin of syphilis in Europe. The chief object of the present communication, is to direct the attention of the Epidemiological Society to some facts which show that the new malady was not long in reaching the shores of Scotland, and in spreading to different towns in that kingdom. In proof of this, I have principally to appeal to some old edicts and ordinances relative to the disease,

* Aphrodisiacus, sive de Lue Venerea. Jena, 1789.
† Vide Grüner's Aphrodisiacus, p. 38. ‡ De Morbis Venereis, 1740.
§ Ueber die Venerischen Krankheiten, 1788.
‖ The History, etc., of the Venereal Disease. London, 1841.
¶ Sur l'Origine de la Maladie Venerienne. Paris, 1752.
** Geschichte der Lustseuche. Altona, 1783.
†† Grüner's Aphrodisiacus, p. 115. ‡‡ *Ibid.*, p. 86.

and to other collateral but slighter evidence bearing upon the subject. The edicts or statutes in question were issued by the Town Council of Aberdeen, in relation to the existence of the malady in Aberdeen; and by the Privy Council of Scotland, in relation to the prevalence of the disease in Edinburgh. The two first edicts in both places were issued in 1497. That of Aberdeen is the earliest. It is dated the 21st of April, 1497. Its words as they stand in the old and carefully preserved Council Records of that city,* are the following:—

"The said day, it was statut and ordanit be the Alderman and Consale for the eschevin *of the infirmitey cumm out of Franche and strang partis*, that all licht weman be chargit and ordanit to decist fra thar vices and syne of venerie, and al thair buthis and houssis skalit, and thai to pas and wirk for thar sustentacioun vndir the payne of ane key of het yrne one thair chekis, and banysene of the toune." (Vol. i, p. 425.)

A few years later—or on the 8th October, 1507—a long list of statutes was passed by the "Prouest, bailyes and counsale" of Aberdeen, for the "common proffitt, weil, and gud reull of the burgh." Two of these statutes refer again to the introduction and spread of syphilis. By the first of these statutes it was enacted "That diligent inquisitioun be takin of ale infect personis with this strange *seiknes of Nappillis*, for the sauetie of the town; and the personis beand infectit therwith be chargit to keip thaime in their howssis and vther places fra the haill folkis." (Vol. i, p. 437.)

Two or three enactments follow in the "statut buk" on minor subjects, one ordering the hygienic measure "that thar salbe certane personis to cleng the toun and dicht the causaies"; and then succeeds another sanitary ordinance relative to the avoidance of syphilis; viz., "That nayne infeccht folkis with the *seiknes of Napillis* be haldin at the common fleschouss, or with the fleschouris, baxteris, brousteris, ladimaris, for sauete of the toun, and the personis infectit sale keip thame quyat in thar houssis, zhardis, or vther comat placis, quhill thai be haill for the infectioun of their nichtbouris." (P. 437.)

The Edinburgh edict regarding syphilis was six months later in date than the first of those issued by the magistrates of Aberdeen, and is more lengthy in its details and provisions. It was drawn up, as I have already said, by the King's Privy Council, and apparently sent to the magistrates for due execution. It is preserved in the first volume of the Town Records

* See "Extracts from the Council Register of the Burgh of Aberdeen", edited by my friend Mr. John Stuart, and published by the Spalding Club.

of Edinburgh, fol. 33, 34, and is entitled in the rubric "Ane Grangore Act";—Grandgore being an early term often applied to syphilis in Scotland. The date and words of the edict are as follows:—

"xxii Septembris anno i^{al} iiii^{c} lxxxxvii seiris. It is our Souerane Lordis will and the command of the Lordis of his Counsale send to the Provest and baillies within this burch, that this proclamatioune follow and be put till executioune for the eschewing of the greit apperand danger of the infectioune of his liegis fra this contagius seiknes callit the Grandgor, and the greit vther skayth that may occure to his legeis and inhabitouris within this burch—that is to say—We charge straitlie and commandis be the authoritie abone written, that all maner of personis being within the fredome of this burch quhilkis ar infectit or hes bene infectit vncurit with this said contagious plage callit the Grandgor, devoyd red and pas furth of this toun and campeir vpoun the sandis of Leith at x houris befoir none, and thair sall thai haue and fynd botis reddie in the havin ordanit to thame be the officiaris of this burch reddely furneist with victuallis to haue thame to the Inche, and thair to remane quhill God prouyde for thair health, and that all vther personis the quhilkis takis vpoune thame to hale the said contagious infirmitie and takis the cure thairof, that they devoyd and pas with thame, sua that nane of thir personis quhilkis takis sic cure vpoune thame vs the samyn cure within this burch in presens nor peirt ony maner of way—and quha sa beis fundin infectit and nocht passand to the Inche as said is be Monounday at the sone ganging to, and in lykwayis the saidis personis that takis the said cure of sanitie vpoun thame gif thai will vse the samyn thai and ilk of thame sal be brynt on the cheik with the marking irne that thai may be kennit in tyme to cum—and thairefter gif any thame remanis that thai sall be banisht but fauouris."

It is almost unnecessary to add that the measures adopted by the public authorities in Aberdeen and Edinburgh were utterly inadequate to arrest the further dissemination of syphilis after it was inoculated upon the country. It seems indeed to have been spread to the more populous towns of Scotland within a year or two after its first introduction into the kingdom. There are some references in official documents of the period which incidentally but amply prove this rapidity in its diffusion. The notices to which I here specially refer exist in the Accounts of the Lord High Treasurer of Scotland. The Register House, Edinburgh, contains a curious and valua-

ble series of these Accounts, detailing the daily expenses of the kings of Scotland from the reign of James III down to the ascension of the English throne by James VI. At the time of the first appearance of syphilis in our northern realm, the throne of Scotland was occupied by James IV, a prince who was a great patron of the arts and sciences of his time. He was a practitioner in them also, as well as a patron of them. At different times we find him experimenting in chemistry, in physiology, and in medicine. His daily expense-books contain many entries of purchases for instruments and materials to make the unmakeable "quinta essentia," or philosopher's stone; and he had laboratories for these investigations both at Edinburgh and Stirling. Like the Egyptian king mentioned by Herodotus, he made a physiological or rather philological experiment to ascertain the primeval language of mankind; and for this purpose His Majesty sent a deaf and dumb woman to live with and bring up two young children upon the island of Inchkeith, in the Firth of Forth—the same island to which we have found the first victims of syphilis previously banished, and itself the old "Urbs Guidi" of the venerable Bede. When the two children, the companions of the "dumb voman cam to the aige of perfyte speach, some sayes" (to quote the account of Lindsay of Pitscottie) "they spak guid Hebrew";* but the cautious old Scotch chronicler sagely doubts the truth of this tradition. King James personally practised the art of leechcraft, as well as experimented in alchemy and physiology. He was, says Pitscottie, "weill learned in the airt of medicine, and was ane singular guid chirurgiane; and thair was none of that professioun if they had any dangerous cure in hand, bot would have craved his adwyse" (p. 249). So states the ancient Scotch historian. The High Treasurer's Account shows that the king had in one important respect a right royal way of gaining patients,—a way by the adoption of which he probably might have secured a considerable consultation and private practice even in these modern days of high-pressure rivalry and keen competition. For he paid his patients, instead of being paid by them. Thus, for example, in his daily expense-book, under the date of April 14th and 15th, 1491, are the two following entries:

"Item to Domenico to gif the king leve to lat him blud, xviii shillings." "Item til a man yat come to Lythgow to lat the king blud and did it nocht, xviii shillings." Some time afterwards he buys from a travelling pedlar "thre compases, ane

* The Chronicles of Scotland, by Robert Lindsay of Pitscottie, vol. i, p. 249.

hammer, and a turcase to tak out teeth"; and forthwith, we find the Scotch king becoming—like the more modern Peter the Great of Russia—not a dentist to royalty, but himself a royal dentist, as the two following entries may suffice to show, (the first of them—provided there be any truth whatever in dental orthography—surely indicating a tooth of rather a tough and tusky character):—

"Item, to ane fallow, because the king pullit furtht his twtht, xviii shillings."

"Item, to Kynnard, ye barbour, for tua teith drawin furtht of his hed be the king, xviii shillings."

He seems to have tried his royal hand also at ocular surgery. But the terms of the following entry rather ominously hint that he was not a very successful operator for cataract:

"Item, giffin to ye blind wif yat hed her eyne schorne, xiii shillings."

A prince imbued with such medical and surgical propensities would naturally feel deeply interested in the first appearance within his realm of such a malady as syphilis; and in his Treasurer's accounts there are several entries indicating that the king had bestowed monies upon various persons affected with this disease. Perhaps these monies were given less in the way of alms, than in the way of a reward for the king's medication of the patients; less for the behoof of royal charity than of royal chirurgery. The entries I advert to all occur during the currency of the years 1497 and 1498.* They are as follows:—the first sum given away being to a person at Dalry, when the king was on one of his many pilgrimages to St. Ninian's shrine at Whitehorn, in Wigtonshire.

September 1497.

"Item to ane woman with the grantgore thair [Dalryre, in Ayrshire], be the kingis' command . . . iijs. vjd."

2 October, 1497.

"Item to thaim that hed the grantgor at Linlithquho viijd."

21 February, 1497-8.

"Item that samyn day at the tounne end of Strivelin to the seke folk in the grantgore . . . . . ijs."

22 February, 1497-8.

"Item the xxij day of Februar giffin to the seke folk in the grantgore at the tounn end of Glasgo . . . . ijs."

* Two of these entries were published by Mr. Pitcairne, in the Criminal Trials of Scotland, vol. i, p. 117. My friend Mr. Joseph Robertson, Superintendent of Searches in the Literary and Antiquarian Department of the General Register House, most kindly collated for me the other entries, while looking over the Treasurer's accounts for another purpose.

April 1498.

"..... seke folk in grangor in Lithgw as the King com in the tounne . . . . . ijs. viijd."

In the course of the preceding remarks I have had occasion to adduce seven or eight different notices with regard to the appearance of syphilis in various cities and districts of Scotland during the years 1497-8, as at Aberdeen, Edinburgh, Glasgow, Stirling, Linlithgow, etc. A diversity of allusions to the same disease, of a less direct and official character, and somewhat later in date, may be traced in various olden Scottish works and writings. The malady is occasionally alluded to, for example, in the reports left us of some of the old criminal and other trials of Scotland. Thus a minute in the Records of the Privy Seal of Scotland records the punishment of a medical man in whose hands a dignitary of the church had died while under treatment for syphilis. The entry is as follows:

January 18th, 1509.—"Respitt made to Thomas Lyn, burges of Edinburgh, for ye slauchtir of umquihile Schir Lancelote Patonsoun, chapellain, quhilk happinit be negligent cure and medicine yat ye said Thomas tuk one him to cure and hele ye said umquhile Schir Lancelote of ye infirmitie of ye grantgor yat he was infekkit with. To endure for xix yeeris. (Subscripsit per dominum Regem apud Edinburghe.)"

Some, perhaps, of my professional brethren may think that this nineteen years banishment from the town was a proper punishment for an unprofessional charlatan undertaking the cure of syphilis in the sixteenth century; and some, perhaps, may even hold, however wrongly, that it would not be an improper proceeding in this—the nineteenth century.

The disease is alluded to in some of the old Scotch witch trials of the sixteenth century.

One of the most remarkable of these trials was that of a lady of station and wealth—Euphame Macalzane, daughter of Lord Cliftonhall, a judge of the Court of Session. Among other matters, she was "indyted and accusit" of using, during the birth of her two sons, anæsthetics in the form of charms and a fairy stone "layit under the bowster," whereby, in the words of the dittay, "your seiknes was cassin of you unnaturallie, in the birth of your fyrst sone upon ane dog, quhilk ranne away and wes newir sene agane. And in the birth of your last sone, the same prakteis foirsaid wes usit, and your naturall and kindlie payne, unnaturallie cassin of you uponn the wantonne cat in the house, quhilk lyke wyis wes newer sene thair efter." In the fourteenth item of her indict-

ment she is accused of trying to break off a marriage by "certane witchcraft," and by alleging that the intended bridegroom had the "glengore." For these and other analogous crimes this unfortunate lady was "takin to the Castel-Hill of Edinburghe, and thair bund to ane staik, and brunt in assis, quick to the death."*

There are also various sarcastic allusions to syphilis by the Scottish poets of these early days, amply testifying to the fact of its rapid diffusion both among the followers of the court—who were then the most common objects of poetical satire—and among the community at large.

William Dunbar, the flower of the old Scottish poets, was, at the period of the first introduction of syphilis in 1497, in the prime of manhood; and in two or three years afterwards, viz., in 1500, he was attached to the king and court of James IV by an annual state pension. In a number of verses addressed to his patroness, the Queen—verses which appear to us at the present day, with our existing standards of taste, as most unseemly and indecent—Dunbar commemorates the communication of the new disease, under the name of the "pockis" and the "Spanyie pockis," to the Queen's men (as he terms them) during the jollities of Eastern's e'en, and the reign of the Abbot of Unreason; and he closes his stanzas with an earnest advice to all youths, to

> "Bewar with that perilous play
> That men callis libbing of the Pockis."†

The after-effects and consequences of the disease he describes as follows:—

> "Sum, that war ryatouss as rammis,
> Ar now maid tame lyk ony lammis,
> And settin doun lyk sarye crockis,
> And hes forsaikin all sic gammis
> That men cal libbing of the Pockis."
>
> "Sum thocht thame selffis stark lyk gyandis,
> Ar now maid weak lyk willow wandis,
> With schinnis scharp and small lyk rockis,
> And gottin thair bak in bayth thair handis,
> For ower oft muckle of the Pockis."

Another and later poet of that age, Sir David Lyndsay of the Mount, alludes to the occurrence of syphilis at the Christmas feasts in an inferior officer of the court, viz., in John Mackrery, the king's "fule," or royal jester, who, according to the poet—like many a fool since John's time—

> "In his maist triumphand gloir,
> For his reward gat the Grandgoir."‡

* Pitcairn's Criminal Trials, vol. i, p. 232.

† See Mr. Laing's admirable edition of Dunbar's Poems, vol. i, p. 111.

‡ Lyndsays Warkis (1592), p. 262.

The same author includes this disease elsewhere (p. 147) among the maladies

> "Quhilk humane nature dois abhor,
> As in the Gut, Gravel, and Gor."

A metrical translation of Hector Boece's *History of Scotland* was made in the earlier half of the sixteenth century, apparently by command of James V. It has been published for the first time, within the last two years, under the authority and direction of the Master of the Rolls. The author of this rhyming "Buik of the Chronicles of Scotland," William Stewart, when translating Boece's account of the fatal disease produced in the old mythical Scotch king, Ferquhard, by the bite of a wolf, tells us (vol. ii, p. 313) that the resulting gangrenous wound defied the skill of the leiches, and the fætor of it, and its discharges were

> "Moir horribill als that time for till abhor,
> No canker, fester, gut, or yit Grandgor."

In the celebrated old poem of the *General Satire of Scotland*, attributed by most authorities to Dunbar, and which, from some circumstances adverted to in the course of it, is supposed by Sibbald and Chalmers to have been written in 1504 (seven years after the first introduction of syphilis), the author deplores the extent to which the disease had by that time already spread in Scotland, observing—

> "Sic losing sarkis, so mony Glengour markis,
> Within this land was nevir hard nor sene."*

In several of the notices which I have just quoted, the new disease, syphilis, is alluded to under the names of "gor," "gore," "grandgore," etc. Few maladies have been loaded with a more varied and more extensive nomenclature. The terms in question, "gore" and "grandgore," are of French origin, and are old names corresponding to pox and great pox—"verole" and "grand verole." In the earlier periods of the history of syphilis they were terms commonly employed by the French themselves to designate the affection. To quote one confirmatory sentence from Astruc (p. 1166), the disease "Gore et grandgore a Gallis initio vocata erat." John le Maire, in his celebrated poem on syphilis, published in 1520, gives this as one of the designations of the disease used at that time by the commonalty:—

> "La nommoit Gorre ou la verole grosse,
> Qui n'espargnoit ne couronne ne crosse."†

Old Rabelais, whose *Gargantua* and *Pantagruel* are perfect repositories of the low and licentious French words of the era at which syphilis first appeared, uses the term grandgore as a synonyme for syphilis; and in his wild allegorical style

* See Banatyre's Ancient Scottish Poems, p. 42. † Astruc, p. 634.

makes the poor and widowed poet, Rammagrobis, take this Grandgore to bed for his second wife. The term grandgore seems to have been applied to the disease in Scotland for a long time after its introduction. In 1600, the Kirk Session of Glasgow requested the magistrates "to consult the chirurgeons how the infectious distemper of glengore could be removed from the city."

In Scotland, as elsewhere, the disease also passed under other designations. When syphilis first broke out it was frequently, as is well known, designated from the country or people from whom it was supposed to have been transmitted. Thus, the Italians and Germans at first generally spoke of it as the French disease; while the French talked of it as the disease of Naples; and the Dutch, Flemings, Portuguese, and Moors applied to it the name of the Spanish pocks or Castilian malady. Dunbar, in the Scottish poem already alluded to as addressed to Queen Margaret, speaks of it, as we have seen, in most of the stanzas under the simple title of "pockis," but in one he gives it, as I have already hinted, the distinctive and significant appellation of the Spanish pocks:—

"I saw cow-clinkis me besyd;
The young men to thair howffis gyd,
Had better liggit in the stockis;
Sum fra the bordell wald nocht byd,
Quhill that thai gatt the Spanyie Pockis."

In two of the Aberdeen Town Council entries we have already seen the malady spoken of as "the sickness of Naples." This name was at first often applied to the malady. The disease was, however, much more generally known in Scotland and in the other kingdoms of Europe under the name of the French pox. The first Aberdeen edict speaks of it in 1497 as the "infirmity come out of France." In the Session Records of the parish of Ormiston for 1662, there is an entry regarding the malady under the appellation of the French pox, one of the minutes being—

"The minister, Mr. Sinclair, hath given out to James Ogilvy, apothecary-chirurgeon, for curing William Whitly, his wife and daughter, of the French pockis, 35lbs. Scots."

Grunbeck and Brandt, who wrote on syphilis in 1496, when speaking of the diffusion of the disease at that early date over Europe, both allude in very vague and general terms to its having invaded France, Germany, etc., and reached as far as Britain.* But the earliest specific notice of syphilis in England

* See Grunbeck, in Tractatus de Pestilentia Scorra, c. 8; and Brant, in his poetical Eulogium de Scorra Pestilentiali—

"Nec satis extremo tutantur in orbe Britanni."

which I remember to have met with is in 1502; and in this notice the malady is spoken of under the same name that I have been adverting to, of "French pox." The notice in question is contained in the interesting Privy Purse Expense Book of Elizabeth of York, the queen of Henry VII, edited by Sir Harris Nicolas. This charitable lady seems from these records to have had several protegés under her immediate care and keeping. Among these protegés is entered John Pertriche, "one of the sonnes of mad Beale." There are various articles of expenditure successively noted in the Queen's private expense book as lavished upon this John Pertriche during the currency of 1502; as "monies" for his "dyetts," for buying "shirts," "shoyn," and "hosyn," "cloth for a gown," and "fustyan for a coat" to him. There are twenty pence expended "for his lernyng;" and the last two items in the account record attempts of two different and rather opposite kinds to amend the mental and moral deficiencies of this hopeful youth. These two ultimate items are—

"For a prymer and saulter (book to John), 20 pence."

"And payed to a Surgeon whiche heled him of the Frenche pox, 20 shillings."

To finish this rough and meagre sketch, let me here add that by the end of the sixteenth century—and perhaps long before that date—the malady was abundant enough in England. Writing in 1596, or in the time of Queen Elizabeth, William Clowes, "one of her Majesties chirurgians," observes to his "friendly reader," "If I be not deceived in mine opinion, I suppose the disease itselfe was never more rife in Naples, Italie, France, or Spain, than it is in this day in the Realme of England."†

PART II. INFERENCES.

The preceding notices, however brief and imperfect, relative to the first introduction and dissemination of syphilis in Scotland, are not simply matters calculated to gratify mere antiquarian curiosity. They appear to me to be capable of a much higher application, for they offer so many elements tending to illustrate the general history of the first appearance of syphilis in Europe. Besides, we may, I believe, be justified in drawing from the data they afford, several not uninteresting nor unimportant corollaries, both in regard to the first origin and mode of propagation of the disease, and the distinction of it from other affections with which it has sometimes been confounded.

† See A Brieffe and Necessary Treatise touching the Cure of the Disease now usually called Lues Venerea.

1st Corollary. These notices tend to corroborate the pathological opinion, that syphilis was a species of disease new to Europe when it first excited the attention of physicians and historians in the last years of the fifteenth century.

Like the twenty and odd cotemporary authors and physicians quoted by Astruc and Weatherhead, the Aberdeen edict speaks of syphilis in the last years of the fifteenth century as a disease hitherto unknown, "the infirmity come out of France and foreign parts." The Edinburgh edict mentions it as "*a* contagious disease callit the grandgore." If it had been previously known, the definite, and not the indefinite, article would have in all probability been employed. And if such a disease had previously existed on the continent of Europe, there is every reason to believe that it would have also existed and been known in Britain. Besides, this reasoning certainly admits of being inverted and changed, in so far that we may probably lay it down with equal justice, that if the disease was new, as it would appear to have been, in Scotland at that time, it was in all probability new also to the other kingdoms of Europe. But if syphilis was thus new in Britain in the end of the fifteenth century, this shows as a

2nd Corollary, That it is a species of disease distinct and different alike—1. from gonorrhea, and 2. from Greek leprosy, with both of which maladies it has, as is now well known, been occasionally confounded; for both these maladies existed, and were abundantly recognised, in this, as in other countries, long before the era of the introduction of syphilis. Gonorrhea was early distinguished by English authors under the name of "burning" or "brenning" *(ardor urinæ, arsura, etc).* Thus, Andrew Wood, in his *Breviary of Health,* 1546, speaks of "burning of an harlotte." "Burning of harlottes" is also mentioned in Bulleyn's *Bulwark of Defence,* 1562. But it is under this same name that reference is made to the same disease in one of the ordinances enacted about 1430, for the better regulation of the eighteen brothels that stood for centuries on the Bankside in Southwark, under the jurisdiction of the Bishop of Winchester. At the above date it was decreed that "no stewholder keep noo woman wythin his hous that hath any sickness of brenning."* This statute was enacted half a century before the introduction of syphilis in England; and nearly a century previously, gonorrhea had been accurately described, among others, by John Arden, surgeon to Richard II, who, writing about 1380, gave a correct summary of the

* See Mr. Beckett's papers in the Philosophical Transactions for 1718.

symptoms, pathology, and treatment of this malady. There is no doubt, further, that gonorrhea was well known to the Greek, Roman, and Arabic authors, and is described unmistakably in their writings.

I might also, if it were here necessary, adduce abundant evidence to show that the two diseases, Greek leprosy and syphilis, though sometimes confounded together, were always in general regarded as two entirely different affections; and that as such, the hospitals severally appointed for the reception of those unfortunates labouring under the diseases in question were kept distinct and separate. Thus, in 1527, the Carmelite monk, Paul Elia, proposed to the burgomaster of Copenhagen a plan for an hospital outside the town for "syphilis, cancer, and other great sores," similar to the Leper Hospital already existing;† for syphilis had, at an early period of its existence, spread itself into Denmark.

When syphilis broke out in Edinburgh, in 1497, those affected by it were not sent to the leper hospital then existing near the town, but they were sent off to Inchkeith. In the course of the next century, we find in the Kirk Session books of Glasgow the two maladies recognised as distinct, and two separate hospitals devoted to those affected by these two separate diseases. For on the 20th October, 1586, the Session "ordains some to visit the leper folks house or spittal beyond the brig, to see how the same, and the dykes of the yards may be reformed, and that nane be received but town's folks." But again, in 1592, the same Session directed "that the house beyond the stable-green-port for women afflicted with the Glengore be looked after."

In the late census of Norway above 2,000 lepers were found in that small kingdom; but the Scandinavian physicians do not confound together syphilis and Greek elephantiasis, and have no difficulty in distinguishing them. Nor have our own colonial professional men in the East, and in the West Indies, where both diseases exist, any dubiety in recognising them as two totally different and specific maladies.

3rd Corollary. As regards the mode or modes in which syphilis was supposed to be so speedily propagated at its first appearance in Europe, the Aberdeen and Edinburgh records are both interesting, though in some respects they offer very opposite testimony on this point.

† Holdtfeldt's Chronik, p. 6. Astruc (p. 116) points to the same fact in regard to Paris, where two leper hospitals existed when syphilis began; but the syphilitic patients were not sent to them, but to other houses specially hired for the purpose.

For some time after syphilis broke out, it was believed, both by the medical and non-medical public, that the disease was communicable, and constantly communicated from the infected to the healthy by the employment of the clothes, vessels, baths, etc. used by those already suffering from it, and by the slightest corporeal contact, or even by breathing the same air with them. I might appeal on this head, if it were necessary, to the individual and general testimony of Schilling, Torella, Brandt, Massa, and almost every other early continental author, historical or medical, who mentions the first outbreak of syphilis. Some even thought that neither the presence of infected persons, nor of fomites, was always absolutely requisite. In his work, *De Morbo Gallico*, published in 1551 (above half a century after the disease commenced), Benedict Victorius, of Fienga, like most of his cotemporaries, still maintained that "the state of the air" (to use his own words), "together with that of the putrid humours, are sufficient to beget the affection;" and in strong confirmation, he adds, "I myself happened once to know some honest and religious nuns, who were confined in the strictest manner, and yet contracted the venereal disease from the peculiar state of the air, together with that of the putrid humours, and the weakness of their habit of body."

The same belief in the easy contagion of syphilis without contact or intercourse extended to our own country. One of the gravest articles of guilt brought against the celebrated Cardinal Wolsey, when he was arraigned before the English House of Lords, in 1529, was the allegation that (to quote the *ipsissima verba* of the indictment, as laid before Henry VIII), "whereas your Grace is our Sovereign Lord and Head, in whom standeth all the surety and wealth of this realm, the same Lord Cardinal knowing himself to have the foul and contagious disease of the great pox, broken out upon him in divers places of his body, came daily to your Grace, rowning in your ear, and blowing upon your most noble Grace with his perillous and infective breath, to the marvellous danger of your Highness, if God of his infinite goodness had not better provided for your Highness. And when he was once healed of them, he made your Grace believe that his disease was an impostume in his head, and of none other thing."*

The notion that the breath of persons having the venereal disease was infectious seems to have prevailed as late as the reign of William and Mary. Dr. Oates, in his "Picture

* Parliamentary History, vol. iii, p. 44; Henry's History of Great Britain, vol. xii, p. 219; The Life and Reign of King Henry VIII, by the Right Hon. Edward Lord Herbert of Cherbury, 1572, p. 205.

of the late King James" (1696), says,—"Tom Jones, your quondam chaplain, was afraid to go to old Sheldon, for fear he should give him the pox by breathing on him" (Part II, p. 106).

The Edinburgh regulations of September 1497 are evidently formed upon the idea that "the contagious plage callit the grandgore," as they term it, was propagated by simple contact, and personal intercourse, or probably even by the air. Hence their strict injunctions for the removal and detention of the "infectit, or that hes bene infectit and incurit," to their secluded position upon the island of Inchkeith, for "the eschewing" (to cite again the words of the edict) "of the greit apperand danger of the infectioune of 'the leiges.'" Indeed, it seems to have been believed that the disease might be communicated through medical attendants, or intermediate individuals who were themselves unaffected. This is at least the natural, or, indeed, the only interpretation of that part of the edict which enjoined that all persons who take upon them "to hale the said contagious infirmitie," go with their infected patients to Inckeith; and if they attended and treated such cases within the city, they did so at the peril of being themselves cauterized on the cheek with the "marking iron," and banished without favour (banisht but favouris) out of the town.

The anxiety of the authors of the Edinburgh regulations to prevent this supposed medium of communication through a third person is further displayed in the severity of the punishment—(the application, namely, of the actual cautery to the face)—denounced against the medical attendants who should infringe the above edict by not passing to, and remaining on, Inchkeith. "Lykwayis the saidis personis that takis the said cure of sanitie vpoun thame, sal be byrnt on the cheike with the marking irne that thai may be kennit in tyme to cum."

For some time after the first outburst of the disease, sexual intercourse with the infected does not seem to have been suspected by any one as the source and means by which the syphilitic contagion was propagated. Nor was the primary affection of the sexual organs generally noticed by the authors of these times as a constant or marked symptom. They were acquainted with, and described, only the secondary symptoms of the malady—the hideous eruptions on the skin—the ulcers of the throat—the affections, and nocturnal pains in the bones—while they mostly all pass over the genital organs, as if they remained unaffected. So much so was this the case, that we find Montagnana, in 1498, recommending, not as a means of infection, but as a means of cure, moderate coition (coitus temperatus). Montagnana speaks of having recommended the

treatment in question (coitus temperatus) to a sick bishop under his care; and perhaps we may venture to guess that such a medical prescription would neither be the most disagreeable medicine in the world to one who had taken upon him the vows of celibacy, nor the one least likely to extend Montagnana's practice among that class of patients.

When treating of this subject, and when speaking of both the usual mode of the infection of syphilis, and its primary symptoms generally escaping notice at the era of the first appearance of the disease, Swediaur observes, — "It is worthy of remark, that although many authors, since the year 1500, make mention of the genital organs, and say that syphilis may more generally (ut plurimum) be communicated by coition; yet not one before that time (1500) points out the affection as essential or characteristic of the disease. All (Swediaur adds) look upon it as a disease pestilential and contagious without coition, and even without any direct contact" (p. 36). The observations of Astruc and Girtanner, and other authors on this point are nearly to the same effect.

In relation to this question, that of the actual mode and means of propagation of syphilis, the edict of Aberdeen, in 1497, is particularly remarkable and interesting, and most fully maintains the character of the capital of the north for that native shrewdness and sagacity which the poet Dunbar long ago solemnly assigned to it. We have just now seen Swediaur, etc. stating that up to 1500 all European writers looked upon syphilis as spreading, pestilentially and contagiously, without coition. Three years earlier, the alderman and town council of Aberdeen seem to have arrived at more just ideas of its laws of propagation, and to have distinctly suspected impure sexual intercourse as the mode of communication of the malady. This seems to be more fully borne out by their ordering, "for the eschewing of the infirmitey," that (to use the words of the edict) "all licht weman be chargit and ordanit to decist fra thar syne of venerie;" and we have the usual glowing and earnest threat of the application of the actual cautery, or "ane key of het yrne (hot iron) to thair chekis," in case of disobedience. The later Aberdeen edicts of 1507, which we have already quoted at length, show, however, that the rulers of the burgh had been subsequently led to adopt the erroneous idea of the leading authorities of the day, that the disease might be transmitted in the way of common contagions, and even, perhaps, by the medium of a third person.

4th Corollary. The early notices that I have adduced of

the appearance of syphilis in Scotland are curious as proofs of the rapidity with which the disease travelled, at its first outbreak, over the kingdoms of Europe. The new malady was, as I have already stated, first distinctly recognised during the period that Charles VIII of France occupied the city of Naples, or rather immediately after he left that place. The cases of the disease that had appeared previously were not, at least, anywhere in such numbers, or in such severity, as to excite any marked and decided degree of attention from physicians or from the public. That Naples was the locality in which the contagion first burst forth so extensively and overtly as to be considered almost the source and cradle of the new epidemic; and further, that this happened at the precise date of the visit of the French army, seems, as has been suggested by various authors, to be shown by the very designations respectively conferred at the time upon the new affection by the Neapolitans and French. For whilst, as already alluded to, the French, as is well known, designated it at its first commencement among them the Neapolitan disease, alleging it to have been communicated to them by the inhabitants of Naples, the Neapolitans, on the other hand, termed it the French disease, believing that it had been brought to them by the victorious army of France. Now the date of Charles's sojourn in Naples is well known. His army, in their march through Italy, arrived at Rome on the 4th December, 1494, and entered Naples on the 21st or 22nd February, 1495; and after remaining three months, they vacated the city on the 20th May. On the 24th of the same month the illustrious Spanish general Cordova landed in Sicily; on the 6th July the battle of Fuornovo was fought, and next day King Ferdinand returned to Naples; but the last remains of the French army did not reach France till the end of the following year. The Aberdeen edict, however, was issued within less than two years after Charles commenced his march homeward. Or, we may state the matter otherwise. Columbus arrived at Palos in Andalusia, after his first voyage to the New World, on the 15th March, 1493, having previously landed at Lisbon on the 6th, and visited the Portuguese king at Valparaiso; while Pinzen, the commander of the other remaining caravel of Columbus' tiny fleet, was, about the same date, driven northward into the French port of Bayonne. Columbus reached Spain, from his second voyage, in April 1496. The edict of the Aberdeen aldermen and council was passed on the 23rd April, 1497, or exactly four years and thirty-eight days from the date of Columbus' first return to Spain; while the famous ordinance of the Parisian authorities regarding syphilis was issued on

the 6th March, 1497, only forty-eight days before that of Aberdeen.*

In reference to the rapidity with which syphilis spread from the south and middle of Europe to this small and isolated kingdom of Scotland, it is necessary to remember that in the last years of the fifteenth century, and during the reign of James IV, the intercourse of this country with "France, Spain, Portugal, Denmark, and Flanders was (to quote the words of the Scottish historian, Mr. Tytler) as regular and uninterrupted, not only in the more solemn way of embassies, but by heralds, envoys, and merchants, as that carried on with England." There was in actual operation, also, at that very date, another medium by which such a disease was very likely to be carried from the continent to our shores and diffused among the population of the larger towns. In November 1495, Perkin Warbeck, under the title of Prince Richard, Duke of York, arrived in Scotland, and was received with regal honours by King James, who bestowed upon him in marriage his cousin, the Lady Catherine Gordon. This pretended claimant to the English throne remained in Scotland till July 1497. He was preceded, accompanied, and followed to this country by gay and reckless "soldiers of fortune" from the Continent, Ireland, England, etc.—the men of all others most likely to transmit and diffuse such a disease as syphilis. These adventurers appear to have been quartered by the Scottish King upon various towns. Thus, the town records of Aberdeen show that, as early as the 5th July, 1495—some months before Warbeck himself arrived in Scotland,—a burgh tax was imposed "to the sustentacioun of aucht Inglismen of the Duk of Yorkis, direkit to the toune by our souerane lordis hienes, and his letteris therapone." (Spalding Club Extracts, vol. i, p. 57).

The speed, however, with which the disease thus travelled from the south of Europe to its western confines has been often employed as an argument to show that the contagion of syphilis was propagated at its first introduction by laws different from those which now regulate its communication. In other words, it has been often alleged that the disease was then spread from kingdom to kingdom, and from city to city by epidemic influences and by general contagion, and not merely by the slower medium of impure sexual connection. We have just seen such a doctrine so far belied by the sagacious regulations of the magistrates of Aberdeen; and when

* Astruc, p. 111.

we look to the then existing state of society, both on the continent and in our own country, to the loose manners and licentious lives of these times, we shall probably find a sufficient solution of the, at first sight, difficult problem of the rapid dissemination of the new malady. The morals of the general mass of the people are ever found to be regulated by the example set before them by the aristocracy and clergy. At the date of the introduction of syphilis into Europe, the notorious habits of the two latter ruling bodies were assuredly such as to expedite greatly the diffusion of the new scourge that had sprung up among them; and hence, at its first outbreak, we find the disease fixing itself upon several of the highest members of the continental courts, and of the church. The Emperor Charles V, and Pope Alexander VI, kings and cardinals, princes and bishops, peers and priests, are openly and publicly recorded among its victims by those who personally watched and described its first ravages. In fact the disease was then scarcely, or indeed not at all, looked upon as conferring any degree of infamy.

In his tract on the malady,* published at Rome in the year 1500, Peter Pinctor mentions by name, and without any reticence, three of the more illustrious patients whom he had treated for this new disease, namely, the Prebendary Centez, the Cardinal of Segovia, and his Holiness the reigning Pope. Writers thought it no imputation on their own characters to publish an account of the disease as it occurred in their own persons. Joseph Grunbeck of Burkchausen, in his essay "De Pestilentiali Scorra sive Mala de Frantzos (1496)," tells his readers how he himself caught the disease from the atmosphere, when walking in some fields near Augsburg. One of the earliest adherents and fiercest champions of the Reformation in Germany was Ulric of Hütten, "the poet and valiant knight of the sixteenth century" as Merle D'Aubigné designates him. In 1519, Hütten, though bred to arms, and not to physic, published a treatise—"De Guiaci Medicina, etc., Morbo Gallico." In this treatise he details his own case and sufferings from the disease, how he had been "utterly vexed with this sycknes,"—had been eleven times salivated for it, and was at last cured by guiacum. This treatise, written as the preface bears, by "that great clerke of Almayne, Ulrich Hutten, Knycht," was subsequently translated and published in England. The disease was, in his opinion, produced "throughe some unholsome blastes of the ayre." His polemical antagonist, Erasmus, in his "Colloquy of Gamos and

* De Morbo fædo et occulto, bis temporibus affligente.

Agamos," denounced fiercely the character of this reforming and literary knight:—"Qualis eques (he exclaims) cui per Scabiem vix in sella sedere liceat!"

In order to show how swiftly a disease, propagated in the way syphilis is, might overrun the society of continental Europe towards the conclusion of the fifteenth century, it is only necessary to allude to the dire and deplorable state of morals among those that ought to set an example in every community, namely, the clergy of these days, as painted by the tongue and pens of their own writers. In an official sermon published by Martene (tom. ii, p. 1758), and preached in St. Peter's at Rome by the Apostolic Auditor prior to the election of the pope in the year 1484, the corrupt morals and dishonesty of the whole church are denounced; and it is added that many do not merely commit, but triumph even in such sins as the subversion of chastity and other virtues (de pudicitia, cæterisque virtutibus subversis, triumphantes). The frightful licentiousness and obscene orgies of the reigning pontiff, and of his family and court, which speedily followed, formed a hideous practical commentary upon this text. A high Romanist, who had the honour of refusing a cardinal's hat, Claud D'Espence, Rector of the University of Paris, after exposing the infamy of the taxes of the apostolic chancery, with its list of "filthy and horrid iniquities" (fœdorum tamque horrendorum scelerum)—a license for any and all of which could be purchased—adds, "You shall say we ingenuously confess that God permits this (Lutheran) prosecution to come upon his Church on account of the sins of men, chiefly of priests and prelates, from whose sins the Scriptures cry out that the sins of the people are derived.....Is it wonderful if the malady descend from the head to the members, from the supreme Pontiff to others? Where under heaven is there a greater license of all evils (infamia, impudecentia, &c.)?.....Truly (adds D'Espence, and he had personally visited Rome), evils such and so great that no one can believe but he who has seen, and no one can deny but he who has not seen...

Vivere qui cupitis sancte, discedite Roma;
Omnia cum liceant, non licet esse bonum.*

Elsewhere the stern and indignant Rector of the Paris University describes the continental nunneries of these dark days as little better than brothels, and the taking of the veil as almost synonymous with a profession of public prostitution.—"Nam quod aliud sunt puellarum monasteria nisi quædam, non dicam

* See Claud. Espencæi Opera Omnia, p. 479.

Dei sanctuaria, sed Veneris execranda postibula, sed lascivorum et impudicorum juvenum ad libidines explendas receptacula? ut idem hodie sit puellam velare, quod et publice scortandum exponere."*

As far as regarded the predisposing habits and influence of the clergy, matters were not better in Britain than on the continent, when the disease first reached this country. We have already seen Cardinal Wolsey, the primate of England, publicly accused in parliament of labouring under the disease. We can, however, wonder the less at the disease attacking such a high dignitary, when we recollect that, according to some writers,† there was openly inscribed over the doors of a palace belonging to this prelate—"*Domus Meretricium Domini Cardinalis.*" The manners of the inferior dignitaries of the church offered only too close an imitation of those of its primate. The commissioners appointed by Henry the Eighth to visit the monasteries of England have recorded a sad, and (even setting aside the influence of prejudice) probably only too true a picture of the moral degeneracy of the great mass of the regular clergy of the time. With some few honourable and cheering exceptions, they found the occupants of most of the monasteries following lives of degraded vice and licentiousness, instead of religious purity and exemplary rectitude. When the visitors received their commissions and instructions, they were dispatched into different parts of the kingdom at the same time, that the monks might have as little warning of their approach as possible. They executed, says the historian Henry,‡ their commissions with zeal and diligence, and made some curious discoveries almost in every house, not much to the honour of its inhabitants. Accounts, he adds, of their proceedings were transmitted by the visitor to the vicar-general, and they contained sufficient materials to render the monasteries completely infamous,—for their gross, absurd superstition, their shameful impositions, their abandoned unnatural incontinency, etc., etc. Some of the old abbots and friars did not attempt to conceal their amours, because they knew it was impossible. The holy father, the prior of Maiden Bradley, assured the visitors that he had only married six of his sons, and one of his daughters out of the goods of the priory as yet; but that several more of his children were now growing or grown up, and would soon be marriageable. He produced a dispensation from the Pope, permitting him

* Weatherhead, p. 62.

† See Sir John Dalyell's Fragments of Scottish History, p. 11.

‡ See his History of Great Britain, vol. vi, p. 434.

to keep a mistress;* and he asseverated that he took none but young maidens to be his mistresses, the handsomest that he could procure; and when he was disposed to change, he got them individually provided with very good lay husbands. "These be the men" (exclaimed Simon Fish, in one of his celebrated public sermons which he delivered at the period we speak of), "These be the men that corrupt the whole generation in your realm, that catch the pox of one woman, and bear it to another; that be burnt with one woman, and bear it to another."†

Clerical morals and manners were not in a much healthier state on the Scottish side of the Border. Towards the end of the fifteenth century, we have not on record any such obscene scandal as was detailed in a previous century in the *Chronicle of Lanercost* regarding Priest John, who is alleged to have publicly celebrated phallic orgies among the young inhabitants of his parish of Inverkeithing,‡ a town which was certainly a place of no small note and importance in these early days. But clerical morals were still confessedly in a sad state about the time that syphilis first appeared in this part of the island. The *General Satyre* of Scotland, written, as I have already stated, at the commencement of the sixteenth century, stigmatises amongst other things—

> "Sic pryd with prellatis, so few till preiche and pray,
> Sic haut of harlottis with thame, baythe nicht and day."§

Queen Mary would seem to have regarded the health of the high Roman church dignitary who baptized her son James with considerable suspicion, perhaps, however, only in as much as he was one of a class with a very bad character in that respect. King James, in "A Premonition to all most mightie Monarchs, Kings, Free Princes, and States of Christendome,"‖ thus refers to it:—"For first, I am no apostate, as the Cardinal (Bellarmine) would make me, not onely having ever been brought up in that religion which I presently professe, but even my father and grandfather on that side professing the same: and so cannot be properly an Heratike, by

* "The Pope consideryng his fragilitie, gave hym licens to kepe a hore and he hath goode writing *sub plumbo* to discharge his conscience." See Letters relating to the Suppression of Monasteries (Camden Society), p. 58.

† See his "Supplication of Beggars", presented to Henry VIII in 1530.

‡ "Insuper hoc tempore (A.D. 1282) apud Invirchethin in hebdomada paschæ, sacerdos parochialis Johannes, Priapi prophana parans, congregatis ex villa puellulis, cogebat eas, choreis factis, Libero patri circuire; ut ille feminas in exercitu habuit, sic iste, procacitatis causa, membra humana virtuti feminariæ servantia super asserem artificiata ante talem choream præferebat, et ipse tripudians cum cantantibus motu mimico omnes inspecantes et verbo impudico ad luxuriam incitabat, etc." See the Chronicon de Lanercost, p. 109.

§ George Ballantyne's Ancient Scottish Poems (1770), p. 42.

‖ King James's Works, p. 301.

their own doctrine, since I never was of their church; and as for the Queene my mother of worthy memorie, although she continued in that religion wherein she was nourished, yet she was so farre from being superstitious or Jesuited therein, that at my Baptisme (although I was baptized by a Popish Archbishop) she sent him word to forbeare to use the spettle in my baptisme; which was obeyed, being indeed a filthy, and an apish trick, rather in scorne than in imitation of Christ; and her owne very words were, that 'She would not have a pokie priest to spet in her child's mouth.'"

Of the dissolute lives of the Scotch, like the other clergy of these times, we may find ample proof in some of the cotemporaneous medical works. We know, for example, from an old medical author, something of the inner life of the identical "pockie priest" who baptized James VI. In 1552, Dr. Jerome Cardan, the famous Italian physician, came from Milan to Edinburgh to visit professionally the high ecclesiastic in question—namely, John Hamilton, Archbishop of St. Andrews—who was suffering under severe and recurrent attacks of asthma. He travelled with all possible expedition, and in these "good olden times" the part of his journey from London to Edinburgh only took twenty-three days. Cardan has left us in his works a copy of the lengthy and very minute medical and hygienic directions, which he drew up for the behoof of the archbishop. Besides giving him innumerable medical prescriptions, he lays down for him excellent rules regarding his food, drink, exercise, sleep, etc., down to the materials of which his bed and his pillows should be composed. He adds for the Archbishop's guidance the following rule—"De Venere. Certe non est bona, neque utilis: ubi tamen contingat necessitas debet uti ea inter duos somnos, scilicet post mediam noctem, et melius est exercere eam ter in sex diebus, pro exemplo ita ut singulis duobus diebus semel, quam bis in una die, etiam quod staret per decem dies."*

The quiet and matter-of-course style in which these rules are laid down and published proves only too strongly the dissolute life of some of the highest clergy in our land; and in order to appreciate the full force of this observation, it is necessary to remember that Cardan's patient was the living head of the Scottish Roman Catholic church of that day—the Primate and Metropolitan of Scotland.† Perhaps still more unequivocal evidence of the scandalous profligacy of the Scottish clergy of these times is to be found in their own statutes, and in the legal documents of the country.

* Cardani, Philosophi ac Medici, Opera, tome ix., p. 135.

† Yet we find the Archbishop, when writing as an author, violently and vir-

In a provincial council of the Scottish clergy held at Edinburgh in 1549, the circumstance that there had come very grave scandals to the church from the incontinence of ecclesiastics (ex clericorum incontinentia, gravissima ecclesiæ scandala esse exorta) was taken into consideration, and the edict of the Council of Basle "De Concubinariis" put in force. Another edict was passed by this Edinburgh synod "exhorting" both the prelates and inferior clergy not to keep their own illegitimate children in their company, prohibiting their promotion of them in their churches, and forbidding the endowment of them with baronies out of the church's goods.* But perhaps the dissolute and depraved state of the Romish church in Scotland is more clearly photographed in a subsequent edict, which they passed in a synod held at Edinburgh in 1558-9. This edict does not "exhort" against incontinence on the part of the priests, but simply and shamelessly lays down a legal limit to the amount of property which they might purloin from the endowments of the church (de patrimonio Christi) for the marriage portions of the bastard daughters of their concubines; and the synod enacting that neither prelate nor any other ecclesiastics should directly or indirectly give with these daughters, in marriage to barons or other landowners, any greater sum than one hundred pounds yearly of the church's patrimony.†

The legitimation of bastard children was necessary before they could inherit or dispose of property, and exercise other legal rights. The Privy Seal Records of Scotland for the earlier years of the sixteenth century have been preserved, and are full of entries of legitimation of the bastard children of Scottish prelates and priests. Lord Hailes gives us some sad information regarding the numbers of the illegitimate children of the Scottish bishops, abbots, and monks of these times.‡ Among others, he states that David Bethune, the immediate predecessor of Hamilton in the archbishopric of St. Andrews and primacy of Scotland, had three bastards legitimized in one day; and afterwards, Alexander Stewart, Bishop of Moray, had seven—five sons and two daughters—all acknowledged in one day. John Lesslie, Bishop of Ross, himself the illegitimate son of an official in the diocese of Moray, viz., of Gavin Lesslie, parson of Kingusie, was the

tuously declaiming against "all kind of lichorie". See fol. li, etc., of "The Catechisme set furthe by the Most Reverend Father in God John Hamilton, Archbishop of St. Andrews", printed at St. Andrews, 1552.

* See the edicts in Wilkins's Concilia Magnæ Britanniæ, tom. iv, pp. 47-8.

† See the forthcoming Statuta Ecclesiæ Scoticanæ, p. 155, edited for the Bannatyne Club by Mr. Joseph Robertson; or Wilkins's Concilia, iv, 20.

‡ See his note to Ballantyne's Scottish Poems, p. 210.

father of several illegitimate children; and it is, says the learned author of the "Book of Bon Accord," sufficiently amusing to find his name among those of the other members of the chapter of Aberdeen who solemnly counselled their ordinary to "caus the lay kirkmen within their diocie to reforme thameselfes in all thair slanderous maner of lyving, and to remove thair *oppin* concubins."*

Concubinage among the lower clergy, provided it was not slanderously open and avowed, would almost seem to have been overlooked and connived at by the church dignitaries of those degenerate times. In Spain, indeed, it was recognised and sanctioned by law.†

The remains of the old chapel of St. Ninian, at Leith, still exist in the vicinity of Edinburgh. The spire of the church is, even at the present day, a conspicuous object above the second harbour bridge, though the chapel itself and its prebendary are degraded to common dwellings. This chapel was founded by Robert Ballantyne, Abbot of Holyrood, and endowed for two chaplains. In the charter of foundation, which is dated 1493 (four years before syphilis broke out in Edinburgh), it is, —in accordance with a common formula in these deeds,—ordained that if "either of the aforesaid chaplains keep a lass or concubine, in an open and notorious manner, he shall be degraded; which seems," as the historian Maitland pertly observes, "to imply this, that they or either of them might keep a miss or misses,provided it were not publickly known."‡

Nor was poverty on the part of a portion of the priesthood apparently any great obstacle to such, as well as to less sinful, indulgences. For, according to the testimony of honest George Marjoribanks (see his Annals of Scotland, p. 5), "In the yeir of God 1533 Sir Walter Cowpur, Chaiplaine in Edinburgh, gate a pynte of vyne, a laiffe of 36 unce vaight, a pock of aite-meill, a pynte of aill, a scheipe-hede, ane penny candell, and a faire woman for ane xviii^{d} grote."

Very shortly before the commencement of syphilis, the dissolute manners of the English clergy, especially of the regulars, created such noise and commotion among the laity, that Pope Innocent VIII sent in 1490 (a few years before the actual appearance of the disease) to Archbishop Merton, authorizing him to admonish his abbots and priors that "by their lewd and dissolute lives they brought ruin upon their own souls, and set a bad example to others." In obedience to

* Bon Accord, p. 377; Keith's Historical Preface, p. xv; Aberdeen Magazine, 1796, p. 270.

† See Prescott's Ferdinand and Isabella, vol. ii, p. 354.

‡ History of Edinburgh, p. 497.

this bull, the primate sent monitory letters to the superiors of all convents and religious houses in his province, admonishing and commanding them, by the authority he had received from the Pope, to reform themselves and their subjects from certain vices, of which they were said to be guilty. The monitory letter that was sent on this occasion to the Abbot of St. Alban's is published in Wilkins's *Concilia*, vol. iii, p. 632. If that Abbot and his monks were stained with all the odious vices of which the primate openly accuses them in this letter, they stood much in need of reformation. Some of these vices, says Dr. Henry, were so detestable, that they cannot so much as be named in history. "You are infamous," writes the bishop to the abbot, "for simony, usury, and squandering away the possessions of your monastery, besides other enormous crimes." One of these crimes was, that the abbot had turned all the modest women out of the two nunneries of Pray and Sapwell (over which he pretended to have a jurisdiction), and filled them with prostitutes; that these nunneries were esteemed no better than brothels, and that he and his monks publicly frequented them as such. His Grace seems to have been well informed, for he even names some of these infamous women and their gallants. The monks, too, were at least as profligate as their abbot, for they also kept their concubines both within and without the monastery.

When such was the scandalous life led by some of the clergy, we cannot wonder that, before the introduction of syphilis, Rabelais (himself at one time a monk) should apply to the gonorrhœal disease the very significant term of "rhume ecclesiastique;" or that, after the appearance of syphilis, this latter and greater malady should have spread speedily among all ranks, down from the clergy to the laity, and from the king to the churl, and should have become diffused by such stealthy but rapid steps over the countries of Europe, as to have at first been mistaken for a malady spreading itself, not by impure intercourse, but by general epidemic influences. And when we advert to the existing state of society in that age, and couple it with such notices as we have found in the Aberdeen records, we may surely (in despite of all that has been written to the contrary, both in ancient and modern times), reasonably doubt whether the laws regulating the propagation of syphilis in the fifteenth and sixteenth centuries were in any degree different from what we know them to be in the nineteenth century. The Aberdeen edict shows that 360 odd years ago, or in 1497, the common mode of infection of the disease was precisely the same as all acknowledge it to be at the present day.

NOTES ON THE EPIDEMY OF CHOLERA-MORBUS AT THE ISLAND OF ST. JAGO, CAPE DE VERDS, IN 1856.

By Dr. HOPFFUS, Surgeon of the Second Class on the Staff of the Cape de Verd Sanitary Department.

Read Monday, Dec. 3, 1860.

THE author commenced by stating that when the adjoining islands of the group—St. Vincent, St. Antonio, and St. Nicholas—were invaded by cholera, the disease prevailed most extensively in the principal towns and sea-ports, but that at St. Jago the chief towns were scarcely assailed; and that the sea coasts, which are generally the localities where cholera first manifests itself, were least of all subjected to its ravages.

In the month of August, 1856, cholera broke out at the island of St. Vincent, and it was supposed to have been introduced there by an English steamer from Madeira. In September, the same disease showed itself in the islands of San Nicholas and San Antonio, into the latter of which, according to Surg. Almeida, it was imported. Much alarm was created in the islands that had been invaded by the disease, and people fled from them in all directions. A vessel with forty persons, some of them suffering from the disorder, arrived at St. Jago in September, and four deaths took place on board while she was undergoing quarantine. After the lapse of five days, without the occurrence of a fresh case, the passengers and crew were landed on an islet, half a mile from the mainland, and after some days were brought to St. Jago. Although neither any of those from the vessel, nor of those in whose houses they lodged, were attacked by the disease, the alarm throughout the island was very great, and all looked forward with anxiety to some impending disaster.

Dr. Hopffus, on his arrival from the Coast of Guinea, on the 31st of August, was informed that the season had been unusually sickly, and that diarrhœa had been the principal ailment. Dysentery had also been prevalent. The season had been irregular, and there had been famine in some parts of the island for nearly two years.

The first case of cholera, or, as it was called, the St. Vincent sickness, at St. Jago, occurred on the 3rd of October, and it terminated fatally in eighteen hours. Another case fell ill

on the 7th, and a third on the 12th, of the same month, with the same result. From this period the disease extended in St. Domingo, Pico, St. Catharine, St. Miguel, and other districts in the interior of the island, where Dr. Hopffus was incessantly and usefully employed in alleviating the prevailing distress. From Dr. Hopffus's observation, it appeared that the disease at St. Jago always followed the line of communication; that it attacked mainly those living in low, damp, and marshy places; but that it also sometimes visited high and well-ventilated spots, and that the blacks were its favourite victims.

Dr. Hopffus confesses his inability to trace the origin of cholera at St. Jago to any certain cause; but his experience led him, from being an anti-contagionist, to the belief that cholera was capable of being communicated from person to person.

The paper contained a topographical description of the districts of the island that were invaded, and concluded with a statistical account of the cases treated by Dr. Hopffus —viz.:

Males	402	
Females	433	
		835
Deaths, 265; of whom were—		
Males	129	
Females	136	
The ages of those attacked were—		
Children of 8 years and under . . .		154
Ditto between 8 and 12 years . . .		110
Persons „ 20 and 50 „		153
„ „ 50 and 65 „		167
„ of 65 and upwards . . .		114
The ages of the fatal cases were—		
Children of 12 years and under . . .		84
Persons between 12 and 20 years . .		45
„ „ 20 and 50 „ . . .		17
„ „ 50 and 65 „ . . .		53
„ of 65 and upwards . . .		66

THE INFLUENCE OF CONTAGION ON THE RISE AND SPREAD OF EPIDEMIC DISEASES.

By GAVIN MILROY, M.D.

Read Jan. 7, 1861.

THE term "contagion" is used to designate the property of a disease being communicable or transmissible from a sick person to a well person, the transmission either being direct and immediate from the sick to the well, or occurring through the intervention of an object which has become infected with the presumed poison of the disease. Etymologically, the term is a bad one, and practically, the general use of it, without a clear and definite understanding of all that it is intended to mean, has certainly served to perplex still more the right consideration of a subject which, in itself, is really a difficult and intricate one. The all but universal employment, however, of the term in professional, as well as in popular, parlance compels us to put up with it.

The simplest kind of contagion is that where a disease is communicable in one way only, viz., by the transmission of a palpable poisonous matter from the body of the sick person, and applied either immediately to the body of the well person, or through the medium of an object which is notably and directly impregnated with the poisonous matter, as, for example, the body clothes or the bed-clothes of the sick. The itch, several forms of porrigo, gonorrhœa, syphilis, and hydrophobia are of this class. The all but universal belief is that it requires the actual application of a palpable poison to the skin (which in some instances must be abraded or without its cuticle) of a healthy person for the contagious propagation of any one of these diseases. The idea of an atmospheric dissemination of their poisonous matter is scarcely recognised in the present day, although in former times this idea was entertained in reference to one at least of the class, as mentioned in Dr. Simpson's paper on Syphilis.

A curious question here presents itself to our consideration. Do the above diseases ever occur spontaneously—*i. e.*, independently of any discoverable, or even any reasonably presumable, transmission of the poison of an already infected person to a well person?—and if such be the case, in what approximate proportion do such instances of the self-engendered disease bear to the instances of its propagation by contagion?

These questions cannot be answered off-hand; for, in truth, there is but little exact information to guide our inquiries, nor has the subject been, as far as I know, ever investigated with anything like scientific precision. That occasionally a fresh and spontaneous development of some at least of the diseases above named takes place in different places, can scarcely be doubted. Not to speak of the itch, the experience of most medical men engaged in practice will have led them, I presume, to the opinion that several kinds of porrigo not unfrequently occur under circumstances which scarcely admit of the suspicion of antecedent transmission from infected persons or *fomites*, and that the disease so developed may afterwards be communicable from the patient to other persons.

In the case of hydrophobia, the occurrence of the distemper *de novo* in the canine race appears undeniable; and if the statement that this terrible epizootic has sometimes broken out in almost an epidemic form among dogs, at distant intervals of time, and without any discoverable cause, be correct, a remarkable illustration of the development of a widely spread specific contagious poison is presented to our notice.*

As to syphilis, the appearance of which in Europe as a "*morbus novus et ignotus*" in the latter half of the fifteenth century, and which, there is reason to believe, manifested itself about the same period in different countries of Europe, the idea will naturally be suggested that if the disease was generated then, why may it not in like manner have been at times generated *de novo* subsequently.† The question, it must be confessed, is a puzzling one; nor does it become us to answer it dogmatically without far more patient inquiry than it has yet received. The same remark may be made as to various other cachectic maladies—the leprosy, for example—respecting the earliest manifestation of which in Europe, and their most frequent mode of development and extension, only

* Hillary, in his work on Barbadoes, described *rabies* as common in the West Indies. Moseley, having never seen a case of it for a series of years, doubted the correctness of the statement; but in 1783 it unexpectedly broke out with violence at Hispaniola, and also in Jamaica, where it prevailed from June to the following March. "Dogs were seized with it that had no communication with others, and some dogs not brought on shore went mad in the harbours of the island." *On Tropical Diseases*, 1803.

† Prescott, in his *History of Isabella and Ferdinand*, remarks that the common story about the importation of this disease from America by Columbus and his companions rests on no better foundation than that of the French troops at Naples having first caught it in that city, whither it had been introduced by the Spaniards. On examination, it would seem that the only connexion between these events is their being nearly cotemporary. He refers for evidence on the subject to the *Lettere sulla Storia dei Mali Venerei di Domenico Thiene*, Venezia, 1823.

the most vague and unsatisfactory information is, as far as I know, to be had. It is extremely doubtful whether the leprosy is ever propagable by contagion. The leprosy is said to have been introduced from the East by the crusaders in the twelfth century. If so, it must have spread over Europe with frightful rapidity.

To pass from syphilis to gonorrhœa; it seems more than probable that the gonorrhœal poison may be generated *de novo*, as cases are continually occurring in practice without any reasonable suspicion of antecedent contagion. Then again, is not the purulent ophthalmia of infants, which is generally believed to be so often caused by the direct action of a simply acrid vaginal secretion during parturition on the eyes of the child, capable of being communicable to other children through the medium of the ocular discharge? Nay, are there not some grounds for supposing that gonorrhœal, or at least purulent, ophthalmia may occur without the direct and palpable application of the discharge to the eye, and merely by exposure to the atmosphere of a ward where numerous cases of the disease are present? This point, like many others, requires an exact and sifting examination before we can speak positively on the subject.

But whatever doubt there may be as to the twofold mode of transmission of any of the preceding maladies, there are, we know, some diseases which are certainly communicable in both ways—viz., by the direct application or inoculation of a palpable poison on the surface of the body of a well person, and also by the dispersion of the poison from the body of the sick, or from *fomites*, into the surrounding atmosphere, and the subsequent absorption of the impalpable virus by the skin or lungs, perhaps also by the alimentary passages along with the food or drink. The contagion is *effluvial* as well as *contactual*. Small-pox, of course, occurs at once to the mind as an illustration which no one will question. The Oriental plague is another disease which has generally, until of very recent years, been believed to be communicable in both ways; but this doctrine has always savoured much more of being a taken-for-granted admission, than of an examined and ascertained proposition. Indeed, the whole history of medical opinion on the contagion of the plague affords one of the most remarkable instances on record of fanciful speculation taking the place of sober and careful inquiry.* That the plague has frequently

* The reader will find an account of the strangely diverse opinions on the subject in this country, during the last hundred and fifty years, in the Appendix to the Report on Quarantine recently printed by order of the House of Commons.

become developed *de novo*, and quite independently of any antecedent infection, cannot be doubted. The recent outbreak at Bengazi, on the Barbary coast, only confirms previous testimony; and as this outbreak occurred after many years disappearance of the pestilence in that place, as well as throughout Egypt and Turkey generally, no other interpretation is possible. Then, as on many other occasions, the disease sprung up amid want, wretchedness, and squalor, and its true nature was not recognised for many weeks, in consequence of its close resemblance to ordinary typhus, to which it seems to be nearly allied.

Although there may be doubts as to the communicability of the plague by the direct application of any discharge from the body of the sick, there is none, it would seem, in the case of a disease in the horse, which has often attracted much attention from medical men, viz., the glanders, not to mention some other epizootic maladies among dogs and horned cattle. All the best veterinarians are agreed that this most destructive disease is propagable in both ways—the contactual, as well as the effluvial or miasmatic. The transmission of the poison to the human subject by handling diseased animals, or articles impregnated with the nasal discharge, proves the danger of direct contact; and the well-established fact that, over and over again, sound horses put into a close and foul stable where the distemper has recently existed have been attacked with it, notwithstanding every precaution to prevent direct communication with any sick animals, indicates its power of atmospheric diffusion.

It is also very generally admitted that glanders is a generable, as well as a propagable, disease; and that it is extremely apt, especially in some seasons, to develope itself in foul, unventilated stables, or (as was often the case during the continental war) in the filthy between-decks of crowded transports. The converse of the proposition is happily no less true; experience having abundantly shown that its development may be controlled even to absolute prevention by the same simple sanitary rules, the observance of which has banished from our jails and workhouses the disease to which I shall next refer, viz., typhus. It is scarcely necessary to say, that this fever is liable to be generated afresh in the impure, crowded dwellings of the poor, as well as that it is extremely apt to be transmitted from the sick to other persons under unfavourable hygienic conditions. Any one who has doubts on the subject I would refer to some excellent papers by Dr. Murchison, whose researches on the different forms of continued fever

promise to be of high value, by determining with greater precision than has yet been done the part which contagion plays in their diffusion. The poison of typhus will often cling, for a length of time, not only to the foul bed and body clothes of the sick, but to close and unaired chambers and cabins in which the sick have been detained.

Allied in many respects to typhus, as regards its development and spread, is hospital gangrene, which on several occasions, even of recent years, has proved a dreadful scourge in crowded military hospitals. Here also may be mentioned the dysentery of camps—a disease liable to be engendered at any time by foul damp air and the use of bad food and drink, and which at first shows little, if any, power of communicability, but which, as cases multiply and when the sick and the well are congregated together, unquestionably acquires contagious properties.

Whether the poison of typhus and other kindred diseases is apt to be conveyed by the clothes of the physician, or of an attendant upon the sick, to other persons, the communicator himself remaining quite unaffected, may be doubted. At all events, the occurrence must be very rare, as we certainly do not hear of the fever being introduced in this way by medical men into their families, or into hospitals, etc., with which they are connected. This mode of conveyance, however, cannot be disputed in the case of the bad forms of child-bed fever. It is to be remembered that the puerperal constitution is peculiarly susceptible to the influence of all miasmatic and noxious atmospheric agencies. That malignant child-bed fever may be developed *de novo*, especially in crowded lying-in hospitals, or whenever the atmosphere of the wards is impure from any cause, is an ascertained fact. Its development, too, from the direct application of a virulent animal matter, as the cadaveric poison, to the vagina of a parturient woman, bears directly upon this question. The coincidence, if not the connection, of puerperal fever with the existence of erysipelas in the house or hospital, before or at the time of lying-in, is a point of much practical interest.

I pass now to the consideration of two pestilential diseases which have afforded, and still unhappily afford, too frequent occasion of marked difference of opinion among medical men on the subject of contagion—viz., yellow fever and malignant cholera.

Dogmatically to deny, as Bancroft and many other writers have done, and this mainly upon theoretical grounds as to the nature or essence of the disease, without regard to the logic of

facts, the communicability of yellow fever under all circumstances and conditions is, as it seems to me, wilfully to shut one's eyes against a manifest conclusion merely because it jars with a pre-adopted doctrine. It must be hard for any one to get over the evidence in the case of the "Eclair" at Boa Vista, where the sick were most improperly crowded together in an unwholesome building, and also of the convict hulks at Bermuda in 1853, not to mention still more recent examples in many of our ships of war in the West Indies. On the other hand, when we know on the best authority that, out of more than a thousand cases of the fever received from infected vessels into the clean and well-ventilated marine hospital of New York, not a single instance occurred of communication from the sick to the attendants, etc., it is obvious that the risk of the extension of the disease is easily extinguished, and that its contagious property is a conditional, and not an essential, attribute, as Dr. Chisholm and his followers have maintained. Pringle, Lind, and Blane held far sounder views on this subject than many of their successors in the public service. Steamers and colliers appear to be more liable to attacks of yellow fever than other vessels. That the morbific atmosphere of foul sickly ships may be wafted to a considerable distance, and thus serve to spread the disease in their neighbourhood, as asserted by many American physicians, is more than likely. Little wonder is it, therefore, that persons going on board such ships are often smitten with it. It is often extremely difficult to get rid thoroughly of the poisonous element from the holds and lower decks of such vessels, especially in hot climates. A high temperature powerfully enhances its activity. That yellow fever is constantly making its appearance, at intervals more or less distant, in various tropical countries quite independently of any suspicion of antecedent importation, just as malignant cholera does in Hindostan, does not admit of doubt. In some seasons, from causes which we have hitherto failed to discover, it exhibits a much greater diffusive and migratory power than in other seasons. During the last ten or eleven years this has been especially remarkable, beyond what has been known before; for the disease has not only shown itself at greater elevations than it was believed to reach, but it has also invaded some countries in the New World, where it had not, as far as we know, been previously seen.

Malignant cholera is much more diffusive and migratory than yellow fever; few regions of the world have escaped its assaults. That the arrival of persons affected with the disease in a locality, hitherto exempt from any traces of its presence,

has occasionally been followed by the occurrence soon afterwards of one or more cases of the sickness in the same house, or among the immediate attendants, cannot be denied. The instances of this sort have almost always occurred either in the dwellings of the poor, or in workhouses, schools, or lunatic asylums, etc. I never heard of an instance among the inmates of a well-conditioned house; and it is universally remarked that medical men are not more frequently attacked than other members of their families, or other persons in the same walk of life. An army on the march has been known to convey the disease, or rather its material cause, to towns and villages along the road; and again, no more fitting receptacle for the reproduction of the poison can be found than the between-decks of an emigrant or transport ship, or of a crowded man-of-war. As to the risk of the subsequent extension of cholera in a locality into which it has been directly introduced by the arrival of persons actually sick with it, this seems to depend altogether upon the circumstance of the disease, in a more or less developed form, existing or not at the time in the locality or in its immediate neighbourhood. If the disease have already indicated its actual presence or immediate advent, the arrival of the sick has appeared to accelerate the epidemic explosion; if otherwise, and the locality and surrounding district be healthy, the disease almost invariably dies out at once with the imported sick, with the addition, perhaps, of one or two fresh cases at the most among their immediate attendants.

In the vast majority of the outbreaks of cholera—and this remark applies not to one country only, but to the wide world—observation has failed to trace any discoverable connection between their occurrence and the arrival of persons already infected; and we are therefore forced to the conclusion that there must be other modes of the transmission of the poison from place to place, and region to region, independently of personal or any other palpable and obvious conveyance. The whole history of the disease proves that contagion plays a very small and subordinate part in its diffusion; and nowhere has the attempt to exclude it, by barring intercourse with places already infected, succeeded in protecting a country from its invasion. Malignant cholera cannot be directly generable, as typhus and dysentery may be truly said to be, by any known or appreciable conditions of local insalubrity, however much these conditions may favour its development, or aggravate its intensity, when it is once present or is close at hand. Filth and crowding may be the *occasion*, but they are not the *cause*

of the disease; they invite and foster its manifestation, but there is no reason to believe that they *per se* generate it. The existence of an atmospheric poison seems to be necessary for its development; but this poison by itself, and without the concurrence of other more recognisable agents, is comparatively innocuous to the human system. When virulently fatal, it has become a binary, if not a ternary, compound.

Although no medical man would think of ascribing the rise or spread of influenza to personal contagion, its history is not without evidence that it has, on various occasions, followed immediately upon the arrival of persons suffering with it in a place previously exempt. Drs. Copland, Hancock, and Theophilus Thompson distinctly recognise the occasional communicability of the disease from the sick to the well; and it has been confidently stated that every known visitation of the epidemic in the Faroe islands has been preceded by the arrival of a vessel or vessels from Denmark, when it was prevailing there. But such a statement must not be too readily received; as it is well known that other islands, equally distant from any continent, have been visited quite independently of arrivals therefrom.

Different forms of cynanche or angina unquestionably manifest at times a contagious property, although their origin and general diffusion are generally quite independent of any transmission of the *materies morbi* from antecedent cases. The same remark may be made in respect of diphtheria. That it is occasionally and partially propagable by personal communication with the sick, we cannot reasonably doubt; but, in the great majority of cases, the development of the disease is spontaneous and untraceable.

The only other family of diseases to be noticed in connection with the present subject is that of the eruptive fevers, to which may be added hooping cough. No one can dispute their highly contagious property; it appears an inherent and essential attribute, and is but little affected by local sanitary and hygienic conditions. Nevertheless, its activity and virulence vary not a little in different seasons and localities. At times, and often for periods of many years, they show little or no tendency to spread from imported cases, notwithstanding the presence of multitudes in the community who have not passed through them; for it is a well established fact, that one attack of the exanthemata very generally secures the person against a second. Do they, or any of them, ever appear independently of all traceable, or fairly presumable, occurrence of antecedent cases? In other words, is there reason to believe that their

morbific poison may be generated in, or be conveyed by, the atmosphere apart from all direct or indirect human intercourse? This most interesting subject has not been investigated with that patient and searching care which all physical problems demand. The prevailing negative belief rests on merely presumptive grounds, rather than on sifting inquiry. That outbreaks of measles, hooping cough, etc., have been observed in various remote islands, and at distant intervals of time, without any traceable connexion with previous cases, either in the country itself or among recent arrivals, can scarcely be doubted. Hillary particularly alludes to his having noticed such occurrences in Barbadoes; and the medical history of other West India islands would afford, I believe, similar evidence. If the supposition be correct as to one or other of this tribe of diseases, the probability is suggested that it may hold good of all. But the consideration of this, and many other points of great interest to the philosophical physician, must be deferred to another opportunity.

I will only remark, in conclusion, that the exanthemata are diseases rather of *persons* than of *places;* and that the power and prevalence of their contagion seem to depend more on the diathesis or constitution of the individuals exposed to its influence, than upon the condition of the localities in which they live. The reverse holds true as to the other febrile diseases, which have been enumerated in this paper. Hence it is that these are much more under the control of ordinary sanitary measures than the proper exanthemata, and one or two other kindred distempers, such as hooping-cough and diphtheria. Of the former, too, more especially, it may be alleged as a general remark, I think, that contagion alone is rarely, if ever, the cause of epidemicity or tendency to epidemic diffusion, but that epidemicity is always a great promoter of contagious activity.

As to the whole subject, which I have thus slightly sketched, it must be obvious that it stands in need of being examined with far greater accuracy than it has yet received from the medical profession generally. Well observed facts and histories are much wanted; and, not less than this, a habit of severe logical induction from such facts and histories, without regard to speculation or doctrine.

ON THE RECENT INTRODUCTION OF YELLOW FEVER INTO PORT ROYAL, JAMAICA.

By ALEXANDER BRYSON, M.D., F.R.S., Inspector-General of Hospitals and Fleets.

Read February 4th, 1861.

In submitting this paper to the Society, it is necessary to mention that it has been drawn up from reports and letters received from the surgeons of the "Icarus," the "Imaum," and "Barracouta," and from the Deputy Inspector General of the Naval Hospital at Port Royal.*

The "Icarus" was commissioned on the 23rd of November, 1859, at Sheerness, and prepared in the usual manner for service within the tropics. Her stores were obtained from the common depôt of the port, and her water from the floating water-tanks in daily use for the supply of ships of war. So little, however, is there known of the naval service in this country, that it may be as well to mention that the stores put into ships of war are in all cases the same, differing only in regard to quantity; they consist of salt beef and pork, flour, biscuit, tea, cocoa, sugar and rum, in casks or barrels; powder and shot, spare sails, sail cloth, and clothing for the men, in bales or packing. The iron water-tanks are placed on a platform in the lower part of the hold, and in steamers the engines are placed nearly amidships, flanked by two large compartments for coals; so that in speaking of the holds of a ship of war, it is not to be supposed that they are filled up with a heterogeneous collection of materials or goods, amongst which there may be several of a character deleterious, or supposed to be deleterious, to health.

Into the lower part of the hold, below the water line, there

* Dr. Kinnear, in addition to the many proofs of the infectious nature of the epidemic, adduced, as strong negative evidence in favour of the same view, the fact of the *Kingston*, with upwards of forty of the *Imaum's* crew, having come in from sea while the fever was raging in the ships and in the hospital, and that notwithstanding she remained a night or two in Port Royal, but without intercourse with the ships or the hospital, and was then sent to the head of the harbour, about five miles distant, she continued throughout the epidemic with her crew perfectly healthy. The *Gladiator* also came into Port Royal about the same time, but departed without having communication, and her crew escaped the disease. The principal medical men of Kingston visited the sick in the hospital, and all were convinced of the infectious and intractable character of the fever.

is generally a little leakage, which is conveyed into the pump-well—a kind of hole or depression in the centre part of the hold—by two channels called limbers, which run parallel to the keel, under the water-tanks, and in steamers under the boilers and engines. This goes by the name of bilge-water; it is often offensive, from its smell of sulphuretted hydrogen, but, so far as I have been able to ascertain, it is seldom injurious to health, and of itself it is incapable of producing any specific disease like yellow fever or cholera. The leakage varies in different ships; but in the largest it seldom exceeds two or three gallons a day, and frequently it is not so much. Every day, if it has accumulated in sufficient quantity, it is pumped out, and the well completely emptied by swabbing. Now, as all the provision casks and packages of every kind are invariably hoisted up and opened on one of the upper decks, and not in the hold, it is hardly possible to conceive that any accumulation of filth can take place in these vessels which could impair the general health of the ships' company, or suddenly give rise to virulent and fatal epidemics.

The "Icarus" sailed from England on the 12th of January, 1860, and arrived on the West Indian station in February. Subsequently, she visited several ports in the Gulf of Mexico, which it is not necessary to mention, as the sanitary condition of the crew showed no signs of impending sickness. On the 8th of June, after having been a week at sea, she anchored at Port au Prince, on the island of San Domingo; here she remained for three days, and then sailed for Port Royal, Jamaica, where she arrived on the 16th. On the 21st she again went to sea, and anchored at Ruatan or Rattan, a small island in the bay of Honduras, on the 27th of June.

Now it was on the passage between these two islands that the first case of yellow fever occurred in the "Icarus." The person attacked was an officer, who had been on shore at Jamaica, and while there had led an irregular life. He was seized on the 24th of June, and died on the 27th. Port Royal and Kingston, the only towns he could have visited, were then, with the exception of sporadic cases, reported to be free from yellow fever. One case had terminated fatally in the Naval Hospital on the 6th of July, but whether the person had been exposed to the infectious emanations from the latter it is impossible to find out—it is sufficient to notice that the disease was not extinct in the neighbourhood; and it was the opinion of the surgeon of the ship, one of the most intelligent officers in the service, that the patient had contracted the fever while on shore; and in this there are few who know anything of

the locality who will not agree with him. A few slight cases occurred afterwards in the "Icarus," but whether of the nature of yellow fever it is impossible to state.

The "Icarus" left Rattan on the 28th of June, and having again visited Port Royal, Jamaica, returned to the bay of Honduras, frequently anchoring and remaining for a day or two at Belize, Rattan, Truxillo, and other places along the coast. On the 14th of August, after having been at anchor for three days at Belize, she sailed for Truxillo, where she arrived on the 20th, and three days afterwards the second case made its appearance; but as eight weeks had elapsed since the death of the first, the one could have no connection with the other. Whether the patient last attacked had been on shore at Belize, is not mentioned, but it was followed by others on the 27th, 28th, and 30th of August, then dropping cases of a less severe character continued to occur up to the 16th of September, when the attacks became more numerous and more severe. Truxillo, where she was then at anchor, was free from yellow fever; but at Belize, which she had just left, it had been raging with great severity, and within three weeks had carried off thirty per cent. of the white population. It is, therefore, more than probable, that the fever was contracted there; for it appears the ship's company had free communication with the inhabitants while on shore on leave.

On the 29th of September she left the coast of Honduras with many sick on board, and arrived, on the 9th of October, at Port Royal, Jamaica. By this time, out of a crew of about 120, eighty-two had been attacked, and thirty-two had died. As soon as possible after her arrival all the worst cases were removed to the Naval Hospital at Port Royal, where other five subsequently died, making the total mortality amount to twenty-two per cent. of the total number of cases.

Nevertheless, notwithstanding the virulence of the fever, and the loss of more than a fourth of the ship's company, it may be said that up to this point there is no positive proof that the fever was infectious, because, according to the views of those who deny the infectious propagation of yellow fever, it might be supposed to depend on some noxious agent existing in the ship, or of an epidemic constitution of the atmosphere which she carried along with her wherever she went; causes of a more extraordinary character than these have been adduced to account for the eruption and spread of yellow fever. Dr. Blair—no mean authority—in his book on an epidemic of yellow fever at Trinidad, mentions that the vessels lying nearest the town, where the fever was raging

with the greatest virulence, suffered but little compared with others anchored further off in the harbour. This he attempted to explain by supposing that the epidemic cause existed in whirling foci on the surface of the water, and that it settled round the vessels, as it were, like swarms of the smaller ephemera gyrating on the surface of a stream on a summer's day.

When the "Icarus" arrived at Port Royal, the inhabitants of the town, the men and officers in the barracks, and the crew of the stationary ship "Imaum," in fact the entire community for fifty miles round, whether on sea or land, were, and for many months had been, healthy, though, as previously noticed, sporadic cases of yellow fever were occasionally occurring amongst new-comers. Unfortunately, the principal naval authorities at Port Royal were disbelievers in the communicability of the disease, consequently the "Imaum's" pinnace, manned by fourteen boys, was sent to take the sick of the "Icarus" to the hospital—a distance of about half a mile, and when they arrived at the wharf to assist them out of the boat and across an esplanade into the hospital. On the following day the same boat's crew took the convalescents to the hospital, and the remaining part of the crew who had escaped the fever to the "Marianne" quarantine hulk; on the 11th they were again further employed removing personal luggage, dead men's effects, and other articles from the "Icarus," preparatory to her being cleared out. While engaged in these duties, twelve out of the fourteen boys went below to avoid a heavy shower of rain, while the remaining two sheltered themselves under the boom boat on the upper deck. It thus becomes evident that if the cause of yellow fever existed within the ship, or amongst her crew, that these boys must have been exposed to it. Accordingly, on the 14th, or three days afterwards, as might have been expected, and was indeed predicted, one of the boys who had gone below was attacked with fever in the morning, and another in the afternoon of the same day; then, on the 15th, six more were attacked, and on the sixteenth, three. All these boys were also sent to the Naval Hospital, where the most of them died.

It was now found out, when too late, that a serious mistake had been made in sending these poor boys to the "Icarus"; but the mistake is to be ascribed to the unfortunate difference of opinion which exists amongst medical men, and not to the executive authorities, whose duty it was to make whatever arrangements were most likely to beenefit the sick of the "Icarus."

Had the fever, after attacking the crew of the boat sent

from the "Imaum," ceased entirely, it might still have been denied, by those who believe only in its terrestrial or atmospheric origin, that it was contagious; for they, the boat's crew, had all been on board, and were necessarily exposed to the same cause or causes which acted with such destructive force on the crew of the ship; and this, or these, supposing there were a plurality of causes, might, by an easy effort of assumption, have been referred to local agencies existing in the hold, or in the surrounding atmosphere.

Fortunately for the sake of truth and the exposition of error, but most unhappily for those who were compelled to remain within the influence of the infectious poison, the progress of the fever did not terminate; for on the following day, namely, on the 17th, one of the boys of the "Imaum," who had not been on board the "Icarus," was attacked, though, while on shore at the dock yard, he had come in contact with some of her officers, and their baggage. Then, on the 19th, there were four men attacked, and on the 20th, two, several of whom were acclimated, and had not been out of the "Imaum" for some time previously. After this the fever spread rapidly, and began to attack both the old and young—the acclimated and unacclimated—in all parts of the ship, until the cases amounted to thirty-eight, of which seventeen terminated in death. Meanwhiie, there being but little communication with the troops in barracks, and the crews of other vessels in the harbour, they entirely escaped the disease.

In this brief description of the progress of the fever, it might be supposed there is ample and convincing proof of its infectious nature; but in the annals of yellow fever there is to be found evidence of a still more decisive character, such, for example, as the introduction of the disease into the island of Ascension, by the "Bann," into Fernando Po, by the "Etna," and into Boa Vista, by the "Eclair;" but as all these facts have been frequently misrepresented by the suppression of truth, or the mendacious assumption of some incomprehensible hypotheses, such as the coincidental occurrence of a peculiar state of the atmosphere, we may well doubt whether the introduction of the disease into the "Imaum" will share a better fate.

Although at present it is not very clear how the fever was first introduced into the "Icarus," there can be no mistake about its introduction into the "Imaum;" and as if finally to determine its communicability, and to show the absolute necessity of adopting in all such cases strict rules of segregation, it was further communicated to the ships' companies of the "Hydra" and "Barracouta." When the "Icarus"

arrived at Port Royal, she was immediately boarded by a boat sent from the "Hydra," in which there was an officer and several men, and her boats were subsequently for two nights employed rowing guard round the "Icarus." Whether any of the men employed in these boats went on board, or how far the boats kept aloof, is not stated; but on the 12th of October, three days after the arrival of the "Icarus," a case occurred in the "Hydra." On the 13th she sailed for the coast of Central America, and on the 14th the officer who had boarded the "Icarus" was next seized; the fever then spread generally amongst the crew. In about a week or ten days she again returned to Port Royal; having lost during her absence five persons, and a number of cases were still under treatment on board. On the following day, as there was every reason to believe the fever would extend if she remained longer within the tropics, she sailed with all her sick on board for a colder climate—the only certain mode of arresting its progress. Subsequently only four cases occurred, of which three died, making altogether nineteen attacks and seven deaths. She reached Halifax on the 13th of November without a case on board. Whether the person first attacked in this instance had been on board the "Icarus," or had visited the hospital, is not mentioned, but he had been on shore at Port Royal, where he got wet; but in whatever way this case was contracted, it does not weaken the proof of the introduction of the fever into the "Hydra."

With respect to the "Barracouta," on the 19th of October, she arrived at Port Royal from the Havanna with her crew in good health. On the 24th, one hundred and three supernumeraries—young men and boys belonging to the "Imaum," all recently from England, and two persons who had been under treatment in the Naval Hospital for dysentery—were sent on board that they might be removed from a locality which had now become dangerous. They were at first placed on the forecastle, in order to separate them as much as possible from the ship's company, with whom they were ordered to hold no communication, as it was more than probable that they were already infected, or had brought with them the germs of the disease in their clothes or baggage. On the same day she sailed with directions to proceed to Bermuda. On the following day, two persons with decided symptoms of yellow fever presented themselves, one an engineer who had come from the "Imaum," the other a boy belonging to the "Barracouta." The former died in four days, but the latter recovered. The next day, the 26th, two boys who had come from the "Imaum" were attacked; one recovered, the other

died. On the 27th, two men, both belonging to the "Barracouta," were the next victims. As it was now clearly evident that the disease had spread to the ship's company, there was no longer any necessity for keeping the supernumeraries apart from them. Consequently a "hurricane house," or a kind of temporary shed, was fitted up on the upper deck abaft the mizen-mast, into which the greater number of the sick and all the new cases as they occurred were removed. On the 28th, the vessel arrived at Bermuda, but the civil authorities dreading the introduction of the fever into the islands would not permit any communication or allow the sick to be landed. Medicines, fresh provisions, and other necessaries were, however, sent on board. On the 5th she sailed for Halifax; but on the afternoon of the 7th she was overtaken by a violent storm, which blew down the hurricane-house and left the sick exposed to the wind and rain. For nearly two days the ship was hove-to, labouring in a heavy sea, and drifting rapidly to leeward; as there was no appearance of any change in the weather, it was wisely determined to shape a course for England, rather than hazard running back into the tropics, where, in all probability, the fever, which was now yielding to the influence of the cold, would again break out with renewed force. On the 25th of November, she arrived at Spithead with only a few of the convalescents still under treatment. Had this vessel remained within the tropics, there is every reason to believe she would have lost at least a fourth of the total number on board; whereas out of twenty cases six only terminated in death.

It has thus been shown, on evidence which cannot well be disputed:—firstly, that the crew of the "Icarus" brought the fever to Port Royal; secondly, that they infected the boat's crew sent from the "Imaum" to remove the sick to the hospital; thirdly, that the boat's crew next infected their shipmates in the "Imaum;" fourthly, in the same manner the sick of the "Icarus" communicated the fever to the boat's crew sent from the "Hydra," and that they subsequently infected their shipmates; fifthly, that the crew of the "Barracouta" were infected by the supernumerary men and boys sent from the "Imaum;" and sixthly, the yellow fever patients sent to the hospital infected other patients who had been in the hospital previously to the arrival of the "Icarus." Thus out of one focus or centre of infection three or four distinct centres were established within the space of a few weeks; each ship being capable of transmitting the disease to other ships, or to distant European colonies within the tropics, where, probably, it had never been heard of before.

FURTHER OBSERVATIONS ON SCARLET FEVER.

By B. W. RICHARDSON, M.D.

Read March 4th, 1861.

DR. RICHARDSON commenced by stating that precisely eight years ago—viz., on March 7th, 1853—he had communicated a paper on scarlet fever to the society, in which he had endeavoured to establish the following propositions:—

1. That scarlet fever, in whatever form or type appearing in individual cases, is a single disease in its universal character, and should have one name only.

2. That after the first ten years of life the liability of an individual to an attack of scarlet fever lessens in proportion to his increase of age.

3. That scarlet fever pays no respect to either sex; but attacks more or fewer of males or of females in a district or country according to the relative differences in the numbers of the sexes in those districts or countries.

4. That the seasons influence the spread of scarlet fever, the disease being most prevalent in the last three months of the year; least so in the months of April, May, and June.

5. That scarlet fever may occur twice in the same person; that such recurrences are very rare, and never, as far as has yet been ascertained, fatal.

6. That the mortality of scarlet fever is greatest in children under ten years of age; is equal in the sexes; is highest in the last three months of the year; is as a general rule twice as great in towns as in rural districts; and is second in extent only to typhus fever, of all the ordinary epidemic diseases.

Since the date in question, the author had from time to time recast these propositions, only, however, to confirm their general correctness. They had also been confirmed by other and independent observers; but there were still many points which the previous paper had left untouched, and to which the present paper would be devoted. The points brought forward on this occasion for discussion were—1. The reason why season influences the spread of scarlet fever. 2. The cause of the difference of types of the disease. 3. The connexion of scarlet fever with acute rheumatic fever. 4. The chemical pathology of scarlet fever. 5. The poison of scarlet fever in relation to its propagation and mode of action.

In considering the first of these propositions, the author mentioned the effects of temperature; barometric pressure; amount of rain; the rate of movement and the electrical condition of the atmosphere. Having gone minutely into these points, he deduced that the inquiry showed but few facts of value bearing on the effects of special atmospherical changes on scarlet fever. It was worthy of remark, certainly, that during a period of eighty-four days, when in one locality there was an equal mortality of sixteen per week, there were fifty-seven days of positive electricity; while in five weeks, during which the rate of mortality was forty-one per week, there were thirty-two days in which there was no electrical manifestation. It might be inferred hereupon that the absence of electrical manifestation was at least coincident with a high mortality; and, on the contrary, that the presence of positive electricity was coincident with a low mortality. But when we see, again, a week of extreme high mortality (one hundred and eighty-eight), during which we have two days of positive electricity; and a week of extreme low mortality (eight), during which electricity was absent on five days; we can but accept the facts, which seem to have had an affirmative meaning, in the light of coincidences. Yet it may be that, in the future, some relationship between the presence of electricity and a low mortality from this disease will be traced; for it is possible that, while electricity in no way interferes with the spread of the contagion of scarlet fever, it produces modifications in the effects of the poison on the animal organism.

But if there is only this one finger pointing affirmatively towards the relationship of meteorological condition and scarlet fever, there is a large amount of negative evidence in the statistics given. We see, for example, that with equal mortality, the most opposite conditions of temperature may be presented; but the most interesting observation is that in reference to the movement of the air. Assuming that the disorder is propagated by means of a volatile poison, it is obvious that such poison is limited in the range of action, or at all events that it is not influenced by the mechanical vibration of the atmospheric sea. In a dead calm, the mortality may in one week be sixteen; and in another week, with a current of air passing over the infected spot at the rate of two hundred and seven miles per day, the mortality shall be the same: while, again, with a week of extraordinarily high mortality (one hundred and eighty-eight), a current of air may be sweeping over the home of the disease at the rate of one thousand and ten miles.

As regards the cause of difference in type of scarlet fever, Dr. Richardson endeavoured, by excluding its various possible

causes, to arrive at the actual cause. His results in this direction were summed up in the following quotation :—

"If we admit—and we are bound to admit as much—that the variety of type of scarlet fever is not dependent upon differences of poison, not on meteorological condition, locality, physical condition of the patient at the time of infection, age, nor hereditary taint, where shall we look for an explanation of the singular phenomenon that, of two children attacked at the same time, the one may be comparatively well at the period when the other lies dead? each event being encircled in the space of a few days. The question is one of the most profound and important in the field of medical inquiry. At this stage of our knowledge we must leave it, with but one supposition, that there is in the organism itself a directing cause which modifies the violence of the poison or intensifies its action; a cause allied to that agency which prevents in nearly every case a repetition of the disease altogether in those who have passed through its stages, whether gently or severely."

The section on the connexion of scarlet fever and rheumatic fever was sketched out with considerable detail, the author not only giving facts from his own observation, but quoting from others who had seen the same: Dr. Golding Bird, Dr. Kelso, and Dr. Ross were thus specially cited. Analogy was also instituted as to the relationship of this complicated affection with the epidemic called "Dengue" in Southern America. In treating of the chemical pathology of scarlet fever, Dr. Richardson classed the disease as belonging essentially to the inflammatory group of diseases. In this respect he differed from Franz Simon, who had stated that the disease belonged to the same class as typhus and typhoid fevers.

Under the last head—the nature and propagation of the poison of scarlet fever—the author dwelt, first, on the physical character of the poison, urging that the poison was not a gas, nor volatile, but a substantive, solid thing. Next, he urged that the poison was thrown off by the lungs or skin, probably with epithelium. Thirdly, that the poison introduced into the body of the healthy subject, by interfering with the natural zymotic process going on in the body, leads to the formation of a product of the fermentative process other than carbonic acid; and that the new product—an oxy-acid—carried by the systemic blood is the cause of all the acute symptoms.

Having pointed out that this secondary poison would necessarily be detected in the excretions of patients, and explained some modifications of his previously expressed views on zymosis, Dr. Richardson left the paper to the discussion of the Society.

OBSERVATIONS ON THE CLIMATOLOGY, TOPOGRAPHY, AND DISEASES OF HONG-KONG, AND THE CANTON-RIVER STATION.

By WILLIAM R. E. SMART, M.D., Deputy Inspector-General Royal Naval Hospital, Bermuda.

Read April and May, 1861.

I. CLIMATE AND TOPOGRAPHY.

THESE remarks are based on notes made during services in the Royal Naval Hospital at Hong Kong from May 1857 to July 1859.

With an idea that the medical records of an establishment dating from the early days of that colony would repay a thorough examination, by elucidating many obscurities, and clearing away errors, from our etiology, I commenced an investigation which I was unable to render as complete as I had purposed, owing to my recall to England on promotion. From the total want, however, of any recent guide to the medical officer and stranger to that station, I am induced to offer these desultory remarks of my own experience and practice, compared with the statistical facts, as a nucleus for future observers. The investigation has been retrospective through thirteen years, from June 1859 to June 1846, which brings us back nearly to the date of Dr. J. Wilson's "Medical Notes on China" founded on his experience in the same Hospital.

The deductions on Meteorology and Climate were made by myself from the monthly sheets of the register kept at the Royal Engineers' Office, access to which was liberally accorded me by Colonel Mann of that scientific corps. The register included in the accompanying tables is from 1853 to 1858, and I think the data may be relied on as the observations seem to have been carefully made.

With the assistance of Mr. Henry Fegan, Assistant Surgeon of the Hospital ship, a most diligent and accurate observer, I was engaged in a parallel series afloat. This was however interrupted, by my departure, when it had begun to be of great interest in proof of the difference of temperature and currents of air, existing in the broad harbour and in the town at the foot of a high peaked hill—affording reason for preference of a floating hospital at that station as at present occupied.

This opinion would very likely be untenable, if the colony were seated on the opposite shore of the harbour.

I am not aware of there being any earlier tables demonstrative of the climate of an island, the central station of our fleets in those seas, and our first territorial acquisition on the coasts of a wide empire, constituting the only emporium, safe hitherto, of a commerce of peculiar importance to our Indian resources, independent of its intimate necessity in relation to our personal wants and domestic comforts.

Before presenting any observations on diseases that have a manifest relation to the climate, it will be consistent to specify the main and peculiar features of the seasons in which those diseases are most developed.

I shall therefore proceed to offer a few cursory remarks on the notations of the more obvious features of atmospheric pressure, temperature, and moisture embodied in the accompanying tables. (See p. 229.)

Atmospheric Pressure. The elevation of the mercurial column is during the cool dry season of the North-east monsoon; and its depression in the hot, moist, electric season of the south monsoon.

The highest monthly average is that of January, from which there is a gradual descent, accelerated in April, until the lowest pressure is reached in August, about the middle of the south monsoon, when it again commences to rise rapidly and uniformly. Thus, the maximum and minimum of atmospheric pressure correspond in time with the height of each monsoon, and not with the variable tempestuous seasons of the changes; the pressure being about medium when these changes occur.

The range of pressure, or mobility of the column, is greatest in the cool season, when the mean pressure is highest.

And yet typhoons—phenomena attended by the extreme of barometric disturbance, occur in the annual period of ascent, and not while the barometric mean indicates the progressive decrease of atmospheric weight.

In typhoons the mercury falls to its lowest point, and yet the rapidity is great with which it rises to its mean height again after the storm has passed; thus when a vortex swept over Macao on the first September 1848, in the central calm of the whirlwind; at 3 hours 40 minutes, p.m. the barometer was at 28.33 inches, from which it began to rise at 3 hours 45 minutes, and at 8 hours 30 minutes, it was at 29.30 inches, having risen just an inch in less than six hours. Extreme variations of pressure such as this must produce effects on the animal system both in health and in disease.

The diurnal atmospheric wave is double—the major oscillation being at its highest from 9 to 10 a.m, and the minor from about 10 p.m. to midnight, the lowest readings between the waves being about 4 a.m. and 4 p.m. There is, however, some variation at different seasons of the year.

ATMOSPHERIC TEMPERATURE. The mean annual temperature exceeding 73° Faht. defines the meteorological position of Hong Kong to be within the limits of the first isothermal or tropical zone, corresponding with the geographical position of the island in 22° 16′ 10″ N. lat.

Lying thus close on the tropic of Cancer it has not the double succession of seasons that characterize positions nearer the equator.

Its summer and winter seasons are well contrasted for its geographical position; but, owing to the prevailing winds of summer, the temperature does not rise so high as it does at Shanghae in lat. 31° 10′ N. where the thermometric range is greater.

At Hong Kong, in the six years period of these tables, the highest notation was 94.5 degrees and the lowest 39 degrees, displaying an interval of 55.5 degrees. These notations not occurring in the same year are of no further value, than to shew that the thermometer may rise or fall to these points. The mean of the highest and lowest notations of six successive years affords a mean range of 46.5 degrees. The mean mensual range of the coldest month January and the hottest July is 33.5 degrees, which is much in excess of that of the same latitude in India.

This climatic feature is appreciated by the residents as highly invigorative of their systems, relaxed and debilitated by the moist heat of the summer months; and doubtless it is so with all who live exempt from exposure or excess. From November to April inclusive, the mean temperature scarcely exceeds 70 degrees, and falls but little below 60 degrees, January and February being the coldest months; but the sun's rays in the clear sky of the dry season are powerful, and calm warm days are then very often followed by cold, clear dewy nights with a cutting northerly wind, in which succession there is great danger from exposure. With slight precautions, however, the climate of Hong Kong from the end of October to the middle of April is pleasant, being dry, bracing and enjoyable.

From the middle of May the mean temperature rises much, and from June to September inclusive it exceeds 80 degrees, July is the hottest month, its mean temperature of six years being 86°.25 degrees, and the lowest mean of any month in the

six years 80.6 degrees; the highest day observation in the same period being 94 degrees, and the coolest night 75 degrees.

The seasons may be divided as follows:—

The cool and dry	. January, February, March.
The heating and damp	. April, May.
The hot and wet	. June, July, August, September.
The cooling	. October, November and December

Daily range of heat:—by hourly notations on the 21st of September 1858, made at the Royal Engineers' Office, the thermometer is seen lowest from 4 to 6 a.m. rising steadily to 2 p.m., then falling to 8 p.m., and more slowly after that hour until 5 a.m. the range being 8 degrees; and by another series, 21st June, 1859, by Mr. H. Fegan, on board the hospital ship, it was found to rise from 6 a.m. to 3 p.m., and then to decline to midnight, from which until 5 a.m. it remained steady, the range being two degrees.

The daily maximum of heat may be said to be centred in the midday hours, widening its ellipse towards the declining sun, relatively to his longer stay above the horizon. The midnight hours are likewise marked by a continuance of equal temperature, but not that of the lowest degree which lies near the dawn of day.

The differences of the *monthly means of day and night temperature* exhibit a remarkable equality, simply proving that the summer range is less than that of winter. They afford no indications of those variations of temperature that distinguish one day from another, even in the hottest or coldest of climates. Our sensations are keenly alive to changes and gradations, and whatever may be the mean height of the thermometer, we speak familiarly of the hot day, the warm day and the cool day, and so likewise of the nights.

Much of this difference to our sensations depends not on temperature abstractedly, as the direction and force of the wind, the degree of cloudiness of the sky, the degree of humidity and the state of tension of the elastic vapour, produce their effects on our sensations in health as well as in disease, by modifying the impression of thermometrical heat.

Nevertheless, the diurnal range of temperature is a most important item in the hygienic constitution of any climate, and we are bound to appreciate it fully where climatic diseases are under consideration.

In this instance, when the same conditions of weather are persistent through the twenty-four hours, it matters not whether the day and night be, what is termed, from our sensations, hot, warm or cool, the diurnal range of temperature will not

vary greatly from what is thus stated to be the mean range of the month.

When, in cloudy weather, the sun's rays have not heated much through the day, and when, through the night, there is not much radiation from the surface, the range will be at its minimum, scarcely exceeding two degrees. No dew will form.

When a warm clear day is succeeded by a night of mean temperature with clear sky and but little wind, the range will be great, from 15 to 20 degrees in winter, and from 10 to 12 in summer; and the extreme point of range will be attained if after such a day there be a strong land breeze with a clear sky, the dew will be greater relatively to the less force of the wind.

These last conditions are to be greatly dreaded in malarious climates. At Hong Kong they are of most frequent occurrence at the early part of the N.E. monsoon, from October to December inclusive. Further on it will be shewn that from pluvio-metric conditions, and the local necessities of cultivation arising therefrom, all that is deemed most necessary for the generation of morbific miasmata coexists at the same season of the year. In our summary of diseases, it will be evident that those usually attributed to malarious causes are very frequent and more than ordinarily fatal in the Christmas quarter, remittent fevers and dysentery of the severest form prevailing then, while in the succeeding quarter of the year, intermittent fevers and inflammations of the upper part of the gastro-enteric canal and of its serous investment, are more common than at any other period. From these concurrent facts we may infer that although the cool season commences in October, yet the sending of reinforcements to our fleet and garrison is best deferred until January, when the adynamic diseases have given place to those of sthenic type.

Again, regarded simply as a meteorological fact, the mere range of temperature of this climate may seem of minor importance, but it is far from being so in the sanitary view. It is admitted that where a high mean temperature exists, the physical forces of animals are less able to endure sudden chills without evincing unhealthy reaction, than in the temperate and arctic zones. From this we should derive a very important indication, not always attended to, to watch carefully that our men on night duty are, especially at that season, well protected by warm clothing, and fortified by the stimulus of warm food and drinks during the night and towards dawn.

By routine we crowd the aliment of our men into a few hours before and after midday, by which the system is left

without support when most urgently demanded to ward off the depressing influences of climate.

I am convinced that the invasion of diseases that have cost the lives of hundreds of our brave seamen and soldiers has been greatly owing to this erroneous system.

These precautions are of highest value whenever men are badly sheltered at night in boats or in tents.

The temperature of the sun's rays, is an important agent in the causation of tropical diseases.

The observations on which the data herein offered are founded, are less complete, and therefore that column in the tables is not conclusive.

So far as it goes, it shows a lowest mean of 91 degrees in March, ascending to 120 degrees, the maximum mean in August, and then descending to a medium stage of 105 degrees persistent in November, December and January, after which a second descent goes on till the minimum is attained in March.

The "mean of the sun's heat in summer" is low, owing to the clouded sky of that season, and the high mean of November, December and January, is dependent on the opposite condition.

It is interesting to note that the "diseases of the nervous system" are more frequent from August to December, and that the fatal cases are most numerous in the Christmas Quarter, when a high temperature of the direct rays is steadily maintained, and our summer precautions are laid aside.

"Insolation" is found under hospital treatment in August and September, and on each occasion the attacks were traceable to exposure on military enterprises.

RAIN FALL. The mean annual fall of 93.18 inches in 111 days is quite enough to characterise the climate as a wet one, even if the fall were distributed equally through the months. By far the greatest amount, and all the heavy falls are during the strength of the south monsoon, from June to September inclusive; but more than an average quantity falls also in the variable winds at the change of the monsoons. In the north monsoon, from November to March inclusive, there is only a small precipitation in gentle showers; and it may happen then, that scarcely any rain falls for months together—contrasting very strongly with the summer months, when it often pours in torrents that overwhelm houses on the hillside, carry away bridges, and destroy roads.

The high ridge of the island attracts to itself the moisture-laden clouds that roll in from seaward, and thus Hong-Kong

receives more than its due proportion of water. Heavy falls are often very limited, and I have looked on the island from the bay and noticed the town glowing in sunshine, while the valleys and ravines at both ends of the island were conducting rushing streams from the clouds discharging on the ridges above them.

To illustrate this contrast of seasons, it may be shewn that in the summer of 1855, June to September inclusive, the fall was 90½ inches in seventy rainy days, and in the same period of 1856 there fell 98½ inches in sixty-eight days:—in the winter of 1856-57, from November to March inclusive, the pluviometer received 2½ inches in twenty-two rainy days, and in 1858-59, from October to April inclusive, only about three inches in seven months. On this occasion there was great distress for water throughout "the island of pleasant streams," which has induced the wealthy colony to obviate such occurrences in future by constructing the necessary works for an unfailing supply.

Such facts will explain how it is that in South China the summer is the luxuriant and the mild winter the arid season of the year, and why there are so many products of more equatorial regions cultivated there.

In summer vegetation is abundantly watered, and, at the same time, fostered by long continued high temperature; in winter there is but little rain fall, with, at the same time, sufficient solar heat to cause much evaporation into an atmosphere that has great capacity for vapour during the day-time. Under these circumstances, vegetation is dormant, the soil being parched, with gaping chinks in its surface wherever moisture was most abundant in summer.

We are taught by medical authority that these are the conditions most favourable to the active development of pathogenic malaria; and the statistics here adduced show that the diseases specially regarded as of malarious origin are, in this instance, simultaneously generated. We cannot, however, fail to acknowledge that these very diseases would have been more general and more deadly in their result, had the course of things been reversed—if the season of heat and drought had coincided, instead of that of drought and coolness.

The malarious agencies of the Canton river are very generally attributed to the extensive rice cultivation known as the "paddy fields," extending mile after mile in swamps, for many months of the year; as the rice-crop requires much irrigation for its success. The land produces two annual crops of this cereal—the seed times being in March, and again late in July,

and the harvests falling early in July, and early in November, each crop requiring about three clear months. Very careful tillage is observed. The soil is ploughed and harrowed when inundated, and then drained to receive the young plants from the nursery beds. The soil is kept always sodden, and sometimes inundated, until the plant shows signs of ripening, when it undergoes a thorough drainage for the harvest, and remains so until the ploughing for the next crop has to be done. In this course of tillage, the rice-grounds are swamps from the middle of March to the middle of June, and again from the middle of July to the middle of October. They are drained for the ripening of crops at the middle of June, and again at the middle of October, remaining dry from that time to February inclusive.

The appended statistical table of diseases corroborates the opinion that the seasons of greatest frequency and fatality of the climatic diseases coincide with those when the rice-fields are undergoing their drying. The months of April and September, when their inundation is almost continuous, are healthy months. These facts seem to confirm the theory that morbific paludal miasmata are evolved from a drying surface, and not from one kept in a wet sodden state.

The heavy falls of rain that occur at Hong Kong in the summer months have a directly salutary influence, as the only scavengers in localities certainly not constructed on sanitary principles. Whoever has visited those parts of the town where the Chinese population is most dense, and to which our seamen and soldiers chiefly resort when on leave, may have noticed the almost entire want of efficient sewers—the *cloaca maxima* being an unvaulted kennel, bounded by the rear walls of premises, wherein every kind of filth lies festering until washed down to the harbour by the torrent from the hill-side. He will find there the Chinese enjoying all the privileges of their own cities, in preserving what they consider the most valuable of all manures; and should he happen to cross the bay when the market-gardeners' boats are returning to the mainland, he will recognise in their wake that they are laden with the odorous fertiliser.

Where such is the normal state, it may be calculated with certainty that typhus and other zymotic diseases are ever incubating, and would be constantly assuming epidemic intensity, were it not for the bountiful water supply of the summer months.

Winds. The distinctive phenomena of this climate are derived almost entirely from the great atmospheric currents termed "monsoons." To understand these, it must be remem-

bered that there is a constant rushing of cool air from the temperate zones towards the most heated part of the tropical belt, which is moving north or south with the sun's declination; and, as the earth is a revolving body, these currents are deflected angularly to meet that revolution; and thus, if there were no opposing causes, these great air-currents would ever flow obliquely from the east towards the zone over which the sun is vertical. In the wide expanses of the Atlantic and Pacific Oceans it is so, and there these currents are called "trade winds"; but as masses of land and masses of water possess very different powers of absorbing and radiating the solar heat, their irregular distribution is productive of variations of the great air-currents. In the Indian Ocean these variations are strongly exemplified, because south of the equator there is a vast unbroken expanse of water, while north of it the Asiatic continent presents a wide surface of land, that becomes highly heated when the sun is north of the equator, and draws towards it then the great current from the south.

The geographical position of Hong Kong is within the normal belt of the north-east trade, which would blow there all the year round if there were no disturbing cause, and it is still the dry winter wind called the "north-east monsoon." In the summer, for the reasons above stated, the south-east trade crosses the equator and strikes on the southern coasts of China, in its course towards the heated plains of Central Asia, and is then named the "south-east monsoon."

Short-sighted creatures we are, that while the humid atmosphere of the summer oppresses us, we sigh for the cool dry air of the northerly monsoon, and almost allow ourselves to indulge the wish that the law of nature regarding the trade winds had had no exception here. But we do this without allowing ourselves to reflect on the change of scene that would result if the dry north wind blew only one summer season, like a simoom, across the plains of China. As it is in the existing order of things, the south winds, that have crossed the heated evaporating ocean, precipitate from their lower stratum of clouds on the peaks and ridges of the coast-line the vapours they bring, and each higher stratum, as it rolls inland, yields its contents to the mountain ranges that oppose its progress, until, at last, the highest give up their fertilising stores to the snowy mountains that form the eastern slopes of the mighty Himalayan range.

Myriads of rivulets descend and unite to form the majestic rivers that roll circuitously to the sea, flooding the plains in the season of rice-culture, and sinking again within their

banks on the approach of winter. Without this grand mechanism for irrigation, the sole spring of which lies in the south-east trade wind, this, the most populous and most anciently civilized country of the world, would be as unprofitable as Arabia, seated at the other extreme of the great Asiatic range; whereas, with it, its productions, both raw and manufactured, vie in richness and in abundance with those of the whole world besides. And, although as sojourners there we may feel discomfort in its summer season, and may be more liable to certain diseases, yet it would not appear that the natives of the land are similarly affected. Constitutional habit, and precautions that become instinctive in a race, lower the susceptibility to climatic diseases, and thus enable the native born to resist causes that would be inevitably fatal to the mere sojourner. Indeed, it is undeniable that the Chinese possess a very remarkable viability in all climates, from the hottest to the coldest, and that they are endowed with endurance for agricultural pursuits in the hottest and most miasmatous countries, together with patient industry unequalled by the natives of other tropical climates.

In the province of Canton or Quang-tong, there are three cities of chief interest to Europeans—Victoria, in Hong-Kong; Macao of the Portuguese; and Canton. These cities are placed, as it were, at the angles of a right angled triangle: Macao is situated at the right angle; and it has Victoria at about forty miles distant from it, a little to the southward of east; while Canton lies at about fifty miles from it, a little to the westward of north.

In treating of the climate, these places will be seen to have leading features in common; thus, the mean annual temperature is as low, and the mean annual range as high, as they can be in the latitude. This arises from two causes: first, a clouded sky in summer, which prevents excessive heat in that season, and gives much rain; second, the north-east monsoon of winter, reducing its temperature. Another feature is, that the seasons of dryness of atmosphere and low temperature are coincident, and those of humidity and heat are concurrent.

With these leading features in common to them, there are still peculiarities of each to distinguish them from the others, which arise, I think, from local conformation, and from topographical particulars. European residents in the province have learned the varieties of climate that exist in their vicinity, and thus they regard the climate of Canton favourably in comparison with that of Hong Kong; and in the summer months they prefer, to both these cities, the open walks and

better ventilated houses of Macao. Considering their proximity, it may appear at first sight strange that there should be any marked difference in their climatic constitution; and yet observation confirms that which the instinct of self-preservation has taught. In the accompanying tables (p. 231) I have arranged the *chief statistical points of difference.* The data of Macao are from the observations of Mr. Beale, an old resident there. They are of more than twenty years date, and were first published in Davis's *China,* and copied into Fortune's work. As that table purports to contain "the means of many years observation," I have contrasted it with the six years averages of Hong Kong. It will be seen that, beyond the most prominent features, there is a great want of accordance. The summer heat is greater, and the winter cold of Macao is more severe, than that of Hong Kong. The annual and mean daily range of temperature at Macao are much wider; but in the latter item the excess is made up by the greater range of the winter months. The Macao climate is the cooler until May, from which, until September, it is the hottest. The summer heat of Macao is the least oppressive, on account of less moisture, and of the openness to sea-breezes. The limits of the rainy season correspond, but the average rain-fall at Hong Kong exceeds that of Macao; and at Macao the months of May and June seem to be those of greatest fall, which at Hong Kong is in June.

The discrepancies between the two climates, as tabulated herein, are so great as to be suggestive of error. It is true that the Macao observations are not of recent date; but it is difficult to imagine that such strongly marked differences could have existed in the data from two localities within forty-five miles of each other. Inasmuch as I find that the observations made at Hong Kong and at Canton in the year 1858 correspond so nearly as to be an argument in favour of the correctness of both, I am disposed to rely on the general accuracy of the Hong Kong series, and to consider that in the Macao series the instruments used may have been less exact than those with more modern improvements; and therefore, I think new data desirable.

The mean results of the Canton register were furnished by Dr. Bekker, Army Pathologist of the Expedition to China. The divergence is very small, on comparing with the Hong Kong register, certainly not more than must occur anywhere between a locality on the sea-shore and one sixty miles in the interior.

The climate of Canton is drier in summer, there is a much

greater difference of night and day temperature all the year round; but the annual range from the mean maximum to the mean minimum is very near, being 34.08 degrees at Hong Kong, against 35.5 degrees at Canton. The greater coldness of winter nights at Canton is evident.

The Hong Kong temperature is much more equable, being somewhat higher in winter and lower in summer; while the annual temperature does not differ the tenth part of a degree.

Although the annual rain-fall is less at Canton, yet the quantity in August and September exceeded that at Hong Kong in the same months.

The barometric data have not been compared in this table, as there is no proof of the Macao observations having been corrected for temperature, as those of Hong Kong are; and the Canton series was made by "aneroid," without standard comparisons.

I shall now proceed to describe the *topography* as briefly as possible.

Canton is grandly seated, as it were, at the apex of a delta, washed on two of its sides by a great river that bifurcates in front of it, so that its impurities could be readily washed away, while the three channels of the river form as many conduits of air-currents; and, at about five miles in the rear, the ground begins to rise at the foot of the White Mountains—affording a good water-shed for the supply of the city.

Macao is placed on a narrow peninsula of small elevation, washed on three sides by tidal waters, and built on from shore to shore, the streets rising in gradation, so that the fresh air-currents from the sea find easy access to the dwellings.

Victoria, in Hong Kong, is very disadvantageously located in a sanitary sense, on the north coast of the island, facing the main land, sheltered from the summer monsoon by the ridge of the island, that forms its peak of 1,700 feet not more than half a mile inland from the shore, and immediately behind the maritime town, which is thus, of necessity, built on steep terraces. The high peak behind the town serves to condense vast volumes of vapour rolled in from seaward by the summer monsoon.

Canton stands partly on red sandstone and partly on slate-rock; Macao and Victoria on the boulders and the clay of disintegrated granite, which serve to retain much moisture, and to nourish a sedgey vegetation in every hollow. The Macao peninsula, being covered with houses, is free from this, while Victoria is hedged in by it with offshoots running down every ravine on its outskirts.

Of late years Hong Kong has become more healthy than it was in the early days of its settlement. The granite records in its graveyards tell of battalions wasting their strength in inglorious service, and of valued citizens who have fallen victims, in the prime of life, to climatic diseases. Deserted barracks, erected at great cost, where malaria was not supposed to reach the inmates, ruined villas in luxuriant nooks, that tell of the good taste of their first occupants, who found in them their death-beds—all proclaim an inherent unhealthiness to European constitutions. It is to be hoped that these costly experiments have left their result, by teaching how to avoid, where we cannot combat, the local causes of disease.

The town of Victoria has had to triumph over the constant renewal of telluric miasmata evolved in excavating the mountain slope to meet the building wants of a rapidly growing population. These disturbances are comparatively unknown in the sister cities, which display the phases of decay, rather than of growth and reproduction. In the early days of the colony, most of the endemic and epidemic diseases were attributed to this cause alone. The feldspar clay that forms the bed of the granite boulders was considered to be the ever-prolific originator of the fatal types of fever, which were then more frequent than they are now. At that time, the immediate wants of a rapidly growing population were met by scarping down the hill side until a terrace was formed to erect a hut on, and thus, the dwelling was backed by a wall of moist clay, and scarcely raised above the damp ground.

Since the consolidation of the soil, and the construction of storied dwellings, those diseases are milder and less frequent than formerly. In fact, epidemic seasons of remittent fevers, dysentery, and liver inflammation are now unheard of, the attacks being of sporadic nature, each case relating its special predisposing or exciting cause.

Having known the place well in 1841-42, and again in 1857-58-59, I may allude to the entirely altered tone of society caused by the residence of the heads of commercial houses, and heads of families. The diseases of climate were, in the infancy of the colony, participated in almost equally by all; they are now rare among the better classes, which I consider to be greatly attributable to altered mode of life, enforced by weighty example.

Since writing the preceding remarks, intelligence has reached of the cession of the Cowloon peninsula, facing the town of Victoria to the north and east, its promontory being about a mile from the quays of Hong Kong. The shores of Cowloon

present several curved lines forming sandy beaches, separated by the granitic spurs that fall from the mountain ridge, situated about five miles inland, that will form, most probably, the boundary of the cession.

In a sanitary view, this possession promises to be of great value, as the gentle rise of the land in hill and valley offers very ample site for extension of a town, in addition to the requirements of what will become a first-class arsenal. The aspect will be a southern one, and well open to the breezes that curve round both extremities of Hong Kong in the summer season. The high peak of that island will continue to attract the heaviest rain-fall; and thus, the new settlement will be the drier in summer, while the range in the rear of the new town will always store up enough for a most ample persistent water supply. The scenery from the new site is grand, both inland and towards the Lymoon channel.

It is to be hoped that the new city will be commenced on a comprehensive plan, and not be suffered to become a thing of patches and incongruities. The land will realize a very high price, which, devoted rightly, will suffice to carry on the public works of drainage, water supply, and sea frontage *pari passu* with the foundations of the city. Commercially, an incalculable advantage will arise from the fact of the town being on that side of the harbour to which the merchant shipping are compelled to resort in the dangerous season of typhoons, to obtain the shelter of the promontory. What is thus naturally the anchorage ground, will be now permanently used as such.

Having thus striven to describe all that it has been in my power to obtain concerning the Meteorology and Topography of Hong Kong and its vicinity, I shall proceed to the consideration of its diseases, dwelling chiefly on those that seem to bear relation to climatic causes.

II.—DISEASES OF THE CLIMATE.

In the first part of this paper I have endeavoured to shew what in the climate seems to bear relation to the diseases and their causation; and I shall now proceed to offer a few observations on the diseases as classed and specified in the Nosological table appended, which is, in fact, an abstract of the "Admission Book" of the Royal Naval Hospital at Hong-Kong.

It has been said already that this retrospective survey extends through 13 years, from 1858 to 1846. Had circumstances admitted of a thorough examination of all the medical

records, there would have been a valuable mass of evidence concerning the climatic diseases, and the results of treatment by various medical officers of high practical attainments who have held charge of the hospital. As it is, I have scarcely passed beyond the mere enumeration of the different diseases, and am compelled to substitute an individual opinion for the sounder ground of statistical data, in treating of their nature, relations and treatment. By this summary there were 4738 cases of disease admitted, of which 69.15 per cent. were cured, 21.50 were sent for change of climate, and 8.65 died. This death-rate does not, however, accurately represent the actual mortality from disease acquired or commencing on the station; for there should also be included the deaths occurring among the invalids on their homeward voyage, at the Cape Hospital, and at our hospitals in England soon after their arrival, which would probably amount to one-fourth of those here returned as "invalids."

Further, of the men who survive, and re-enter the sea-service, many die of visceral lesions, the sequel of "dysentery, hepatitis, &c." It has on several occasions happened to myself when serving on the other stations, to perform "autopsies" on men who, within a moderate period, had been invalided from China, and to find in them old structural changes in the large intestine, the liver and spleen, referrible to the diseases contracted there, and I cannot doubt that most naval surgeons have similar notes on recollections; all those cases should increase the bill of mortality, if it were in our power to estimate them.

On the other hand, it should be borne in mind that the patients admitted into our foreign naval hospitals are selected cases, which, except in epidemics or in severe accidents occurring on the spot, have undergone treatment already, at the hands of a qualified medical officer, who sends to the hospital the severe acute attacks or the chronic structural lesions, which he finds unmanageable on board ship. To render a true nosological basis, the medical returns of the fleet on the station, of which this summary forms but the sequel, should be fused with it, which would reduce the rates of invaliding and death by climatic diseases.

With the reservation, then, that the appended table is composed of cases of more than ordinary severity, we may now proceed to consider its results.

CLIMATIC DISEASES.—The total numbers contain 11 per cent. of fevers; 31 per cent. of diseases of the intestinal canal; 2.3 per cent. of diseases of liver and spleen; and 1.3 per

cent. of undefined diseases, termed debility or cachexy. Of these last, inasmuch as I have generally known the term applied to cases in which the most prominent feature has been a derangement of assimilative functions, dependent either on splenic disorder as a sequel of intermittent fever, or on atony of the villous coat of the small intestines, and of their chyle-absorbent system—a morbid condition frequently attended by irregular attacks of lienteric or of serous diarrhœa, I have not hesitated to combine them with fevers and abdominal diseases in a group that embraces the diseases of highest pathological interest to Europeans in the South of China. This group presents the following ratios of cures, invalidings and deaths:

Classes of Disease.	Admitted.	Cured.	Invalided.	Dead.	Remaining
Fevers	621	517	65	37	2
Intestinal diseases	1471	853	363	245	10
Liver diseases	107	61	26	20	—
Cachexies	59	36	22	1	—
Totals.....	2258	1467	476	303	12
Ratios per cent		65·0	21·1	13·4	

The mortality was thus more than one-eighth of the number treated, and the invalids one-fourth of the remainder who were unfit for further service on the station.

That climatic and the varying seasons have great influence on the production and in the aggravation of this group of diseases is observable in the quarterly returns:

Period.	Admitted.	Cured.	Invalided.	Dead.	Remaining
Quar. ending March	387	235	82	70	—
„ June	458	304	97	45	12
„ September.	664	474	114	76	—
„ December..	749	454	183	112	—
Totals.....	2258	1467	476	303	12

But the usually defined quarterly divisions of the year do not exactly correspond with the actual increase and decrease of these diseases.

April and September are the points of least frequency of the group. The healthy season is the spring, when the soil is thoroughly dry, previous to the commencement of the rains, and that of insalubrity coincides with the seasons when the plains are undergoing artificial drainage for the rice harvest, or when

the whole surface is drying by spontaneous evaporation, with no rain-fall.

The better, or least unhealthy season, embraces the period from February to May inclusive, and the isolated month of September.

The more unhealthy seasons are from June to August inclusive, and again from October to January.

The following table exhibits the relative frequency and mortality of the climatic diseases at those seasons.

Classes of Disease.	Admissions.	Cured.	Ratio per cent.	Invalided.	Ratio per cent.	Dead.	Ratio per cent.	Remaining.
Yearly Period:								
Fevers	621	517	83.25	65	10.46	37	5 94	2
Intestinal Diseases ..	1347	767	56.2	337	25.02	233	17.3	10
Liver Diseases	98	57	58.16	21	21.42	20	20.42	..
Spleen Diseases	9	4	..	5	..	..	..	..
Cachexies	59	36	61.01	22	37.32	1	1.7	..
5 *months Healthy Season:*								
Fevers	177	139	78.53	18	10.1	19	10.7	1
Intestinal Diseases ..	389	228	61.79	87	23.57	54	14.63	..
Liver Diseases	32	20	62.50	4	12.50	8	25.	..
Spleen Diseases	2	1	..	1	..	..	..	..
Cachexies	20	13	65.00	7	35.00	..	..	..
7 *months Sickly Season:*								
Fevers	444	378	85.86	47	10.09	18	4.05	1
Intestinal Diseases ..	978	539	55.11	250	25.57	179	18.3	10
Liver Diseases	66	37	56.10	17	25.72	12	18.18	..
Spleen Diseases	7	3	..	4	..	..	..	..
Cachexies	39	23	59.	15	38.45	1	2.55	..

There are many interesting points deducible from this table.

The mortality of the entire class of fevers is shewn to be as low as 5.04 per cent., while that of what has been defined "the better season" is as high as 10.7 per cent., and that of "the worse season" is only 4.05 per cent.

This seemingly parodoxical result arises from the fever attacks of summer being more numerous, and at the same time more the result of ordinary febrile causes, from which they are more amenable to treatment, than the fever attacks of the better season, which are less numerous, but, relatively, more frequently of the severe remittent type—the result of special exposure, so that an equal amount of mortality falls in a much smaller number of admissions.

Variola is the only example of the eruptive class of fevers entered on the hospital books. The cases all occurred in the months from January to May.

The Chinese inoculate for the disease in the spring, so that small pox becomes epidemic among them at that season. Of the 15 cases enumerated, 7 came under my treatment in the spring of 1859; and of them 4 presented unquestionable marks of vaccination; 2 had not been vaccinated; and in one vaccination was doubtful. The only fatal case was one of those unvaccinated.

When these cases were in hospital at Hong-Kong, the same disorder prevailed among our marine battalions at Canton, and also among the crews of ships at Whampoa, in the Canton river.

The propagation of cowpox from imported virus is uncertain. I failed on two occasions with lymph received from Madras; and I was acquainted with failures in the hands of others.

The table exhibits the prevalence and greater intensity of diseases of the abdominal viscera in the months of falling temperature with a drying soil—from October to January inclusive, and again in the hot moist weather of June to August. Not only have we this great statistical proof of the influence of season in those diseases, but another in the fact that, at the seasons of greatest frequency of bowel diseases, the dysenteric type is relatively more frequent than the diarrhœal type, and *vice versa*, in the healthy season of spring, the diarrhœal attacks have a much more equal ratio than in the autumn, when those of dysentery greatly preponderate.

It may seem strange that in the most densely populated country of Asia, with an immense river population, *Asiatic Cholera* is not of frequent occurrence in epidemic form. In the 13 years through which this investigation extends, there is but one choleraic season shewn by the admissions. That was the summer of 1858, and then the cases that occurred at Hong-Kong among the Europeans, either ashore or afloat, were fatal in a large ratio, yet they were truly sporadic and never acquired epidemic intensity among the European community.

Mr. T. A. Caldecott, acting colonial surgeon, in his report for 1858, states, there were of Europeans seventy-four attacked and thirty-four dead.

And further: "Previous to last autumn no well-authenticated case of cholera was recorded to have happened in Hong-Kong. "What per centage of the Chinese population of Hong-Kong was attacked by the disease, and what proportion of those attacked died, it has been impossible to ascertain. It is well known, however, that a very considerable number were

carried off by it. It is reported that as many as one thousand four hundred were destroyed by the disease at Aberdeen," a fishing village on the south-west coast of Hong-Kong.

Mr. Hobson in his annual report, 1858, of the Chinese Hospital at Shanghai, states: "Cholera, however, which is the plague of India, is rare in China."

Enteritis, which I assume to be the designation given to inflammation of the small intestines in contradistinction to that of the large intestines, or dysentery, is found like the latter disease to have greatest frequency in the later half of the year, while *gastritis* is most frequent in the first half. *Peritonitis* seems to be also a disease of the earlier months, and it is noticeable that pleuritis, the inflammation of another serous sac, is most frequent in the same months as peritonitis. As the numbers are insufficient to warrant an assumption of this being the rule, we can, awaiting further data, only regard it as a coincidence.

Among the bowel diseases there is a curious case of *Tympanitis*. The patient had been previously treated in hospital for a similar attack. The large intestine was found enormously distended with flatus, so that the much elongated sigmoid flexure curved back parallel to the transverse colon into the right iliac fossa, giving the similitude of a double colon. The muscular coat of the small intestine seemed paralyzed throughout; but no intussusception was found.

The intestinal diseases are here shewn to have their greatest frequency at the same seasons as fevers. In the former, increased frequency and greatest mortality are coincident, which has been already explained not to be so with fevers as a class or group.

Liver diseases follow much the same general order of occurrence as dysentery; but the inflammatory diseases of the liver seem to be more prevalent earlier in the season, preceding, as it were, the bowel disease.

That variety of inflammation of this organ frequently complicated with dysentery, is to be found mostly at the same season when the dysenteric type of disease is most severe, viz., in the Autumn.

The ratios of mortality and of invaliding in liver diseases, are found to be almost of equal value with those of dysentery; thus, the mortality being 20·4 and 20·8 per cent., and the invalidings 26·5 25·47 per cent. respectively in the two diseases.

Inflammation of the spleen is either rare or diagnosable with difficulty, there being only nine cases recorded, four of

which occurred in July and two in October; there being no instance from October to March inclusive. There were no deaths, but five required removal to another climate.

Of the ill-defined cases classed as "*Debility, or Cachexy,*" twenty that occurred in the least unhealthy season had seven invalids; and of thirty-nine in the unhealthy season, fifteen were invalided and one died.

The distribution of fever cases into the *continued, remittent, and intermittent classes*, would, at first sight, appear to be a very simple and easily decided matter.

In clinical practice it is not so, and errors are very frequently committed on this point, especially in localities where the recognised causes of malaria are evident; and where all diseases, whether of febrile or of inflammatory organic nature, assume the periodic form as soon as the adynamic state of the vital powers supervenes.

Such a combination, I consider, prevails very generally in the localities and diseases which are now under discussion; but I am strongly of opinion that the "foregone conclusion" of marsh miasmata being the foundation of all attacks of fever has often led to ambiguity of diagnosis, and to fatal errors of practice. Undoubtedly, no season of the year is free from purely miasmatous fevers; but there are seasons when, and localities in which, more frequently than others, they occur of unquestionable type. Even, granting that malaria is here a pervading cause of fever, the physician cannot, with safety, blind himself to the existence of other causes that often exert an all-sufficient power to excite pyrexial diseases.

I am disposed to think that, in the majority of fever attacks in this climate it may, perhaps, be discovered that simple exposure to the sun's heat, disregard of sanitary precautions, either voluntary or enforced, and indulgence in habits that disorder the digestive functions or depress the nervous forces, have immediately preceded the invasion of fever, standing in the relation of exciting causes here as in every other country. Such cases are amenable to the general principles of treatment of common continued fevers, whether of the ephemeral, congestive, synochal, or typhous types, and they must not be brought to swell the charge of insalubrity of climate. But when these causes act as the excitants of fever on the system already imbued with the malarious periodic cachexy as a predisponent, or combine their influence with malaria in localities where, or in seasons when, miasmata are abundantly evolved, the result is either "*adynamic remittent,*" or "*typhus with remissions,*" according to the predominance of one or the other set of causes.

Under these circumstances, the complications will be found most frequently centered in the abdominal viscera. There will be dysenteric or miasmatous inflammation of the large intestine, and typhoid deposit or ulceration of the Peyerian patches of the small intestine, as the organic lesions, with, sometimes, multilocular hepatic abscesses. But pleuro-pneumonia, black disorganisation of the spleen, and inflammation of the secreting tissue of the kidney, will occasionally accompany, combined or singly, the constant structural changes of the enteric mucous surface and its follicular glands.

This, I consider to be the pathology of the disease known locally as "HONG KONG FEVER"; and in searching for the causes, I can discover readily enough the elements out of which both "zymosis" and "malaria" are generally thought to arise. Such composite causes may fail to produce the exact type of either disease; and in the epidemics of different seasons and localities some one or other group of symptoms will be found to preponderate, still having enough in common to identify the disease. There is often an eruption in this fever, consisting of sudamina, that become opaque and seem to fill with pus, or of small furuncles and superficial abscesses, and sometimes deep-seated abscesses result.

When the zymotic causes predominate, as in the summer and autumnal fevers of 1858 and 1859 among our troops in garrison at Canton, the typhomania and the rose-coloured eruption, ineffaceable on pressure, and persistent after death, which characterise "typhoid," are truly pathognomonic of the lesions to be met with in the autopsies. I possess full histories of such cases, well recorded by Mr. Courtney, surgeon of one of the marine battalions, which must remove all doubt of the existence of the same zymotic causes of typhoid in the southern cities of China, as in the crowded parts of the cities of Europe. In these cases, the structure and membranes of the brain, the lungs and their serous covering, and the intestinal glands, are the seats of morbid changes, that show too plainly that the whole mass of the blood has undergone deterioration. The frequent entries in the admission book of intermittent fever with diarrhœa, intermittent with splenic enlargement, remittent fever with dysentery, remittent with hepatitis, fever with diarrhœa, fever with bronchitis, fever with pneumonia, all tend to elucidate the various fevers of the climate or their complications.

TREATMENT OF FEVER. The first class of fevers, those that arise from ordinary causes, will yield to the same treatment as is applied to them elsewhere. Emetics, purges, and saline

diaphoretics will usually suffice, the local complications, if any exist, being attended to. In the ardent fevers, with active congestion of the brain or the lungs, general and local abstractions of blood are very useful in the stage of accession. Indeed, care must be taken that, in allowing all that is due to our modern dread of depletion, as well as to our local suspicions of the miasmatous origin of fevers, we do not too long postpone the best means of checking the advance of vascular conditions that tend to inflammation of vital organs. On the other hand, when typhus is the type of fever, or typhoid symptoms have supervened, ammonia, wine, brandy, and nutriment, carefully and regularly administered, will be found the surest means of checking the progress of the disease. Quinine, in these cases, is the best restorative tonic we possess after the subsidence of the pyrexia. If it is given as an antiperiodic febrifuge in the pyrectic stage, it rarely benefits, but often sets up an erethism that retards the convalescence.

In purely malarious fevers, whether intermittent or remittent, quinine is the only reliable remedy. In intermittents, doses of ten grains in solution, with a few drops of laudanum, if there be purging, administered every fourth or sixth hour to the third dose, beginning in the full sweating stage, will substitute cinchonism for the periodism of the fever, and most frequently the paroxysm will not be repeated.

In decidedly remittent fevers, whether of the pure or of the complex form, quinine is again the chief remedial agent. In its exhibition we have merely to watch that exacerbations of heat and restlessness alternate with stages of composure and partial sweats, to commence with confidence the administration of that remedy, and to repeat it as long as the fever signs are declining, or not again increasing, which should be the indication to substitute antimonial salines, or ammoniated draughts, according to the type of the reaction—synochal or typhoid. A combination of calomel with quinine, in proportion of one-and-a-half or two grains of the former with four to six of the latter, repeated as above, appeared to me to possess some advantage in combating the visceral complications. This treatment was adopted from the practice of Dr. George Burn, my predecessor in charge, whose results were highly satisfactory, showing, in the years 1857 and 1858, in 341 cases of "fever of all types," a mortality of 4·4 per cent.

Quinine is the sheet anchor in our treatment of the periodic fevers of South China, and the inauguration of the sweating stage may be usefully regarded as the signal for its exhibition;

but in my own practice I preferred to wait until the second remission, in order to ascertain in the first remission the extent of the complications. This precaution was impressed on me by having seen a case, in which there was a congestive cerebral complication, terminate by coma in the remission, after the exhibition of full doses of quinine to cinchonism; and the apprehension was thus aroused, that the medicine had so far lowered the circulatory forces as to increase the state of vascular congestion in the sensorium, and that the reactionary force was thus altogether extinguished. For this reason, too, the cerebral complication must at once be regarded as admonitory of great caution in the use of the drug in every stage. The application of epispastics and counterirritants is of great value in relieving the active congestions of the exacerbations, and the passive congestions of the remissions. In the typhus complication stimulants must be administered freely.

The powers of quinine as a prophylactic were proved extensively among the crews of the gunboat flotilla employed on the Canton river. Although those little vessels were constantly on river service, often remaining the night with their bows driven on the mud-banks, their crews sleeping on deck in preference to the close heated atmosphere of 'tween decks, having no medical officer on board, and thus receiving merely an eleemosynary medical supervision from the larger men-of-war they came near, yet they seemed not to suffer disproportionately from malarious fevers, excepting those of the intermittent type. Their comparative exemption I considered to be due to the abundant supply of quinine wine ordered for them by Dr. Deas, the medical inspector of the fleet. On the slightest occasions of indisposition they had recourse to their commanding officers, who held the quinine bottle at hand, in the preventive and curative powers of which the seamen seemed to have the utmost confidence.

The practice of giving quinine wine as a prophylactic extended from us to our allies. In the summer of 1859 it came to my knowledge officially that their agent at Hong Kong was authorised to procure the means of affording an ample supply for the expedition in Cochin China.

The question of the affinity of remittent fever and dysentery is one of prime importance. It is still open to discussion whether these diseases have a common origin in that mysterious agent, malaria, of which we may point out the haunts without being able to assign any of its material characteristics, knowing it by its manifestations, rather than by its intrinsic nature. My opinion is that dysentery is a disease as much of

periodic type as the fever termed "remittent;" because of whatever kind it be, whether acute or chronic, sthenic or adynamic, there is in it an increased or paroxysmal excretory effort, between midnight and dawn—the same period when, in remittent fevers, we look for its chief remission, with paroxysmal excretion from the skin.

Now, let us regard the act of purging as the mere evacuation of an increased follicular secretion or exosmotic exudation from the villous surface of the large intestine, and we may recognise in it the analogue of the sweating stage of fever, which takes place at the same nocturnal period:—the act of purging being merely an accident of place to dispose of a diseased product that has been thrown off into a sphinctral canal; the increased secretion being the essential action in both these cases.

Again, it happens frequently enough, that men who have been long stationed at miasmatous places, acquire a leucocythæmic expression, betraying the malarious cachexy. Such men will for the most part state, that "when they have no flux they get the shakes"; thus, in fact, regarding bowel flux as a safety valve to periodic fever, they neglect it until some exaltation of the capillary exosmotic action, or some check to the follicular secretion occurs, when the excited capillaries dispose of their contents into the submucous tissue surrounding the follicles, and true dysenteric disease is established. This is the frequent history of some of the most certainly destructive cases of insidious chronic dysentery; and again, clinically, many of the worst cases of acute dysentery will be found to have been preceded by intermittent fever; and lastly, the adynamic remittent scarcely ever fails to present more or less of destruction of the mucous coat of the large intestine, by ulceration, or sloughing, or both combined.

Again, the ordinary professional definitions of diseases give grounds for the pathological combinations they express, and the hospital physician, towards whom all professional difficulties converge, is well placed to collect the general opinions or ideas on such subjects. Now, in this instance, cases are continually being sent to hospital defined "fever and dysentery," or "remittent fever and dysentery"—the definition expressing the conviction, in those who have seen the cases from the earliest period of invasion, that these diseases have been distinct though coexistent; or, if analysed more deeply, that constitutional disorder had displayed itself in the form of fever prior to the localization of inflammatory action in the large intestine. There is much practical importance, too, in this

sequence, equalling that between an attack of pneumonia with symptomatic fever, and one of idiopathic fever with pneumonic complication—distinctions that demand great differences of treatment.

After numerous autopsies, I have less hesitation in believing that the infiltration of the submucous, and sometimes subserous, tissues of the walls of the large intestine, from the ileo-colic valves to the anus, in every form of dysentery,—existing from the earliest period in the acute disease when the mucous surface resembles the pile of crimson velvet, to that when it has sloughed away in parts, or when, in the chronic disease, foul ragged ulcers have excavated the thickened wall—is a heterologous blood exudation almost as incapable of reabsorption or of organization as the tubercular deposit is.

Believing, then, that it is of that nature, and finding the rule of its most severe or most frequent occurrence to run parallel with a specific toxæmic fever, often coexisting with it, it seems to me highly probable that they originate in the same cause.

I have frequently examined with the microscope the exudation of dysenteric stools, and have found prismatic crystals of the triple phosphate, and sometimes smaller black acicular crystals—perhaps of hematine, mixed up with amorphous granular matter—probably phosphate of lime, pus-corpuscles, epithelial scales, and shreds of tissue, and I have concluded, perhaps too hastily, that the *materies morbi* is contained in the elements of the crystals and amorphous matter. The morbid changes in the renal secretion in dysentery are worthy of investigation. I had commenced to study them, and had frequently detected albumen in it in that early stage when the bowel excreta are of sero-sanguineous character, and found that the albumen has changed for lithate of ammonia when the product of disease in the alvine evacuation has undergone change from the fluid to the solid exudation matter.

These observations require extension, however; but, as far as they go, they indicate that the kidneys are actively engaged in the depuration of the blood, while the submucous tissue is being made the seat of a diseased deposit.

Pathology has substantiated that in the zymotic blood changes of typhoid fever, the Peyerian patches of the small intestines attract to themselves, for elimination, the exudation-matter called the "typhous deposit"; and I cannot perceive why, in malarious impregnation of the blood, the mucous follicles or crypts of the large intestine may not, likewise, have a special eliminative attraction for the elements of the specific

materies morbi. We know not why, in typhoid fever, the Peyerian follicles are made the outlet, and we are equally ignorant why, in miasmatous diseases, the cæcal and colic crypts should be so. A field for investigation here offers itself to the pathologist—a field which will naturally embrace that frequent attendant of dysentery, acute suppuration of the liver. I do not doubt that the practical teaching of such an investigation will greatly favour prophylactic measures, by proving it in our power to avoid the predisposing and exciting causes of all those diseases.

Treatment of Dysentery. This has been, in great measure, of an empirical character. Bloodletting, calomel and opium, ipecacuan, Dover's powder, and astringents—both vegetable and metallic—have been extolled, in turn, as panaceas in all the varying types and stages of the disease. Doubtless, each of these remedies has been found of value in the treatment on some occasions, and quite useless, if not injurious, under other circumstances of season and locality.

My opinion is, that one leading distinction is this,—whether the disease be of that acute type which attacks the newly arrived and the previously healthy, or of the more insidious form preceded by alternations of intermittent fever and diarrhœa; and another all-important point is that of its being in the first or inflammatory stage of progressive exudation, or in the second stage of removal of that deposit by ulceration; or, lastly, the sequelæ of the disease, when a slow process of healing is going on, with diminished functional power, or when indurated ulcers are established.

In the acute form and in the inflammatory stage, bloodletting, general and local, and the warm bath, are always the earliest means to be used. Everything should be done with a view to diminish the inflammatory impulse, to keep the muscular coat of the bowel at rest, and to determine to the surface, as long as the excretion is of mucus and blood, and, *à fortiori*, when it is of serum, blood corpuscles, and lymph-flakes.

Purgatives of any kind, especially calomel, which excites the discharge of bile into an already inflamed canal, can only have an injurious effect. Astringents, which tend to check the exosmotic action by which the inflamed capillaries are relieving themselves, are pernicious.

Ipecacuan possesses of all known remedies the most relaxant power on the mucous tissues, causing a kind of internal diaphoresis and checking the peristaltic action of the lower intestines, by nauseating, and thus reversing, that of the upper part

of the canal, and by producing vomiting, by which the secretions poured in by the lower and the upper mucous glands are prevented passing through the large intestine. Opium, which calms the nervous excitement, deadens the pain and assists in moderating peristaltic action, is also invaluable. In this consists the merit of the treatment proposed by Surgeon Docker, of the Royal Army, from his practice at the Mauritius, of giving large doses of ipecacuan combined with laudanum. In my practice I have found the most satisfactory results from this treatment, preceded by venesection and the warm bath. The recumbent posture and epithems to the abdomen, with absolute diet of rice or barley water, are most important adjuncts. When the tenesmus is lessened, and the passage of bile and fæces shews the cessation of ileo-colic obstruction, a laxative of castor oil, with laudanum or oil of turpentine, will be useful; but after the second or third fæcal stool, further action should be checked by opiates, administered by mouth, and in starch injection. As the symptoms moderate, the doses of ipecacuan are to be gradually diminished; and, at last, when bloody mucus has given way to opaque mucoid or muco-purulent discharges, some mild alterative, such as hydrarg. cum cretâ, may be combined with the ipecacuanha.

This mode of treatment, as far as I have seen, cures more in the first stage, by resolution, than any other; but, even with it, absolute success must not be expected, as some cases will run to a fatal termination in the first stage, and others will progress to the second stage, with dense infiltration of the submucous tissue. That is known to have occurred when the pyrexia having abated, there remains a minor degree of tenesmus and tormina, with tenderness, accompanying an altered state of the evacuations. Then, the modified treatment, by ipecacuan with alteratives, epispastics, and blisters, and sometimes leechings over the tender points, and anodyne enemata, especially about midnight, is still most to be relied on. If breach of mucous surface has occurred, as indicated by renewal of mucus streaked with blood and pultaceous or curded matter in the stools, the use of the vegetable tonics and astringents, as cinchona, quina, and calumba, with occasional alterative laxatives, is to be had recourse to, and a broth, farinaceous diet, with a little port wine may be allowed. If the symptoms be obstinate, the alternation of the mineral astringents, especially if there be passive hæmorrhage, will be advisable. The terebinthinates will often be of great service in this stage; but should the urinary bladder partake of irritability they must be suspended. Unless the patient can be brought to feel that all injudicious ingesta are most detrimental to the dis-

eased alimentary canal, any mode of treatment will be very unsatisfactory. If this second stage is not most certainly lapsing into that of cicatrization, as shown by slowly improving health, less frequency of evacuation, subsidence of tormina, and alteration of the excreta to a more healthy consistence, the best and only safe course is to send the patient away beyond the Straits of Sunda, especially if the summer or autumn is at hand.

In closing my remarks on "remittent fever" and "dysentery," I would presume to suggest that "zymosis" should be made a generic term; animal poisons, and those of the vegetable world, of which "malaria" would become an important feature, forming separate classes. I am decidedly of opinion that, notwithstanding the difference of vegetable and animal elements, the better we become acquainted with the diseases now under consideration, the more evident it will be made to us that a "zymosis" is established in the blood by the atmospheric vegetable poison called malaria, which is generally acknowledged as the excitant of a specific form of fever, and which, I believe, localizes its excreta, the blood principles that have undergone its specific zymosis, in the crypts or walls of the large intestine, as typhus does with its excreta in the follicles of the small intestine.

There is another form of bowel flux that often proves fatal in China. It is sent to hospital as "diarrhœa acholyca," on account of the yeasty or pipe-clay stools; as "diarrhœa with marasmus," or "diarrhœa with debility," on account of progressive emaciation and loss of energy; and, when aggravated by tenesmus, as "diarrhœal dysentery." It frequently proves fatal, and very probably the entire mortality by diarrhœa is attributable to this form of disease.

The same form is known in India as "diarrhœa alba" and "Hill dysentery." It differs essentially from tropical dysentery in not being a disease of deposit, but simply one of nutrition from non-absorption of aliment, dependent on functional derangement of the chyle absorbents, the spleen, and the liver. The food passes off from the bowels undigested or as chyme, and when the disease proves fatal of itself, it is by absolute starvation; the whole body being in a state of extreme emaciation, and the intestinal coats reduced to a diaphanous thinness.

I have inspected such corpses, and found them without any organic anatomical lesion. The spleen may have been gorged with blood, and the gall-bladder may have contained pale bile in some, but then in others it has been distended with dark

bile, that had tinged the mucous surface of the duodenum and ileum. In an interesting case of the disease recorded by Dr. Burn, in which fatal dysentery had supervened, "the cystic duct was impervious to fluid, and the gall bladder was distended with thin yellow bile."

The disease often termed "diarrhœal dysentery" is mostly of this nature in the first stage. In it we shall find that the dysenteric symptoms have usually been preceded by alternations of diarrhœa and intermittent fever. By many this is associated with the scorbutic dysentery; but, as far as I have seen, œdema of the legs is the only external sign common to it and scorbutus.

It is said to be very common among Europeans in India; but, in China, it was much more rare among the European than among the Indian troops.

Dr. Alexander Vans Best, of the Indian army, who had charge of the sepoy general hospital at Stanley, Hong Kong, informed me that the mortality in that hospital caused by this disease was in the ratio of eighty per cent., increased to ninety per cent. in the cold season; and that the Hindoo sepoys died of it almost entirely, while the Mahomedans were carried off by fever. He attributed this result, in great measure, to religious abstinence from animal food on the part of the Hindoos, a practice much less prevalent among the Mussulmans; and, in a minor degree, to malingering abstinence, in order to get sent back to their native country, the nostalgic passion being strongly implanted in them. He has stated that death sometimes invades by serous effusion on the brain; and that, in the older sepoys, chronic bronchitis, alternating with the diarrhœa, gives a better chance of recovery.

In the early stage of this disease cordial deobstruents with opium and mild alteratives, together with light nutritious animal diet and wine, are the remedies most to be depended on. In the confirmed degree scarcely any treatment is of avail.

Entozoa are of very frequent occurrence, especially among the crews of ships on river service. Only a single case is here nosologically classed as the cause of admission; but they were found to exist very frequently in men labouring under other diseases, especially the climatic fevers and bowel disorders, and it very commonly happened in autopsies of such cases to find these creatures alive in the intestinal canal or in the peritoneal sac where perforation had occurred. The presence of entozoa is very probably a strong predisponent to dysentery by the irritation they maintain in the canal. The "lumbricus teres" is of very frequent occurrence, and the "tænia"

is more rare. I believe that, zoologically, they do not differ from the human entozoa of Europe.

The laws of generation of these lower animal forms are not understood, and the channels by which they are received are still unknown. The popular notion is that the ova are imbibed in marsh water, or in the water of rivers which receive much sewage. It is said that the Chinese themselves are not thus infested, from their habit of substituting water that has been boiled and converted into infusion of tea as their constant beverage. If this statement be true, the frequency must be greatly diminished in steam-ships that have condensing apparatus for the supply of water. This is not yet ascertained.

DISEASES OF THE NERVOUS SYSTEM.—These, as a class, are much more frequent in the latter half of the year, and their fatality is highest in Christmas quarter. The month of January is unaccountably free from them. The quarterly abstract yields thus :—

Period.	Admitted.	Cured.	Invalided.	Dead.	Remaining
Qr. ending March	21	10	7	4	—
„ June.....	24	10	11	2	1
„ September ..	36	17	17	2	—
„ December ..	38	12	16	10	—
Totals	119	49	51	18	1

The increased ratio of invalidings and fatal terminations in the Christmas quarter, is very marked in paralysis and in delirium tremens, the admissions being then also in excess in these diseases, as also in epilepsy and insanity. I am unable to explain satisfactorily this, which is seemingly at variance with the general idea, that disorders of sensorial function are more frequent in hot climates, and the more so in their summer season. The rarity of the idiopathic inflammations of the brain and its membranes is equally remarkable.

The cases here classified "insolatio" have been scarcely different from ordinary continued fever with cerebral complication. In them I have seen instances of decline of the sensorial symptoms after the setting up of purulent discharge from the meatus auditorius, which may be regarded as indicative of the resolution of inflammatory action within the cranium.

In delirium tremens the per centage of deaths is 30 on the whole admissions, and 41.5 in the last quarter of the year. The increase of frequency and mortality in that season is pro-

bably caused by the crews of ships getting leave on shore as soon as the cooling season commences, and it is noticeable that the increase of "syphilis" is contemporaneous.

In considering the very high rate of mortality, it must not be forgotten that the first and most amenable stage of the disorder is generally treated with success on board the ships, the cases only that prove intractable there being sent to hospital, as "dyspepsia" or as "gastritis" if still in the prolonged first stage, and it is very possible that two-thirds of the entries under those designations are cases of that nature. This arises from a falsely charitable desire to give the offender the benefit of any question as to the cause of his malady. I have known the cloak of charity thus misplaced even in the third stage, when convulsions precede coma, by sending the patient to hospital as a case of "epilepsy." Very often is this delusion kept up until death has rendered further concealment of the truth a matter of no importance to the self-made victim. For these reasons the great mortality is not to be attributed to climatic causes.

Hydrophobia, as a consequence of rabies canina, is known throughout China. In the summer of 1858 an ordinance was published at Hong Kong enforcing preventive measures against this disease. The disease had already led to the destruction of the valuable dogs in a large mercantile house there; not, however, before two domestics had received bites that led to fatal consequences. In March 1859, a case fell under my treatment that proved the existence of rabies far in the interior of China. Its history was as follows. In Lord Elgin's expedition up the Yeang-tsze or Nankin river, when about five hundred miles from the sea, a fine young Newfoundland dog was bitten unprovokedly by a Chinese cur. In about ten days the dog sickened after fright. He was then fastened up in a boat with all the symptoms of "rabies," of which he died on the fifth or sixth day. A boy, who had been slightly grazed on the back of the hand by the dog's tooth, on the 24th or 25th of December, came to Hong Kong in his ship in February. On the 9th March, seventy-five days after the injury, he first felt indisposed, and on the 11th of March he was admitted to hospital suffering from the pathognomonic signs of hydrophobia, of which he died the same day.

Although noticed in Chinese medical works, yet many European practitioners in China have not seen the disease there, and therefore this case has the greater value in adding to the scanty evidence we possess, the knowledge that the disease exists in the interior as well as on the sea coasts.

The localities concerned in the history of the case, and the chief places and dates are as follows:—The ship left Woosung, on the coast, on the 8th November; she arrived at Hankow on the 6th of December, and left it on the 12th December. The dog was bitten near Woochang on 15th December, and was seized with the first symptoms of rabies at Kew-Kiung, near the Poyang-lake, on 24th December. On that or the next day he inflicted a bite on the boy. The boy became ill seventy-five days afterwards, and died of hydrophobia on the seventy-seventh day from insertion of the poison.

The evidence was conclusive that the animal had undergone no risk of contagion between 8th of November, the date of leaving Woosung, on the sea coast, and the 15th of December, when he was bitten by another dog, and unless we are prepared to admit a period of thirty-six days incubation in the dog, we are compelled to accept the 15th December as the date of inoculation, except, indeed, we prefer a theory of spontaneous origin of the disease.

Diseases of the organs of sense do not offer much of special climatic or epidemical interest, except in *ophthalmia* There are forty cases of that disease recorded, all admitted in July; and of these, thirty-eight occurred in July 1846, all being of catarrhal conjunctivitis. Epidemic visitations of the disease seem common in the early summer, as if the south-easterly winds bore along with them, on strata, the irritating cause. In 1859 a similar epidemic was felt, in June the affection was general at Macao, and towards the end of that month our garrison and the Chinese population of Canton were suffering. A little later it prevailed at Hong Kong, and then swept up the coasts to the northward, so that ships bound down to Hong Kong ran as it were into a zone, where half the crew would be attacked almost simultaneously. The course of this epidemic zone, and its daily progress, might have been almost laid down in the charts, by noting where successive ships fell under its morbific influence.

Diseases of the respiratory organs were not sufficiently frequent to make them of primary climatic importance. The admissions of the entire group amount to 6.2 per cent. In this, the ratio of deaths, 14.25, and of invalidings, 40 per cent., show more than average severity of disease. These numbers relate to idiopathic diseases, and I am not prepared to state the results of the pulmonary complications of the climatic fevers; but my impression is that pneumonia complicating fever is less fatal, and pleuritis, on the contrary, more fatal, than when of idiopathic form.

This group consists of two main divisions; the inflammatory consisting of pneumonia, pleuritis, and bronchitis (which last embraces all hospital cases of catarrh); and the tubercular, hæmoptysis and phthisis. Of the former division, April to July, and, again, October to February, are the seasons of prevalence, January and May being the climaxes. Of the latter division, April and May and from October to December inclusive, are the seasons.

Pneumonia, with its death per centage of 28, is more frequent from May to September, and again in December and January, its period of greatest fatality being from October to January. Pleuritis is least frequent from June to September, and seems to be generally amenable to treatment. Bronchitis is found at all seasons, but least in August and September.

Of the tubercular diseases of the lung, from April to June and from October to December are the chief seasons,—April and October presenting sudden increase of numbers, from which there is a gradual decrease to September and to January respectively.

I do not recollect having anywhere else seen phthisis run its course so rapidly as it has done here, in a few cases, at the spring and fall of the year. Seemingly healthy individuals take severe cold, running on to bronchitis of sub-acute form, the phthisical diathesis is aroused, acute tuberculosis goes on, and a month has sufficed to carry off several whom I watched to the last. All phthisically disposed persons ought to be very careful of themselves in April and October, when the rains begin and terminate.

Diseases of the Circulating System.—Of this group I have very little to say, from having had but small experience of these affections in China. Of this I was convinced, that men "under a cloud," who might reasonably be suspected of an endeavour to get removed from their ships, often complained of functional derangement of the heart as their only malady. In a case of diseased mitral-valves from acute inflammation, the termination was by death in the homeward voyage; and in one which I had treated for secondary heart disease with ascites and œdema, from preceding disease of the kidneys, the dropsy disappeared during the voyage.

Diseases of the Genito-urinary Organs.—In order of frequency this group falls next in importance to the strictly climatic diseases. The renal cases are only seven in number, of which two died and three were invalided. Gonorrhœa, with its complications and *sequelæ*, orchitis,

stricture, prostatitis, and cystitis, enumerate 168, of which 23.45 per cent. were invalided. This group of diseases is severe of its kind, and more so in the first half of the year, when orchitis and cystitis are by far more frequent complications than in the last half. The following table will expose the relative seasonal frequency.

Disease.	Ladyday Qr.	Mid-summer	Michael-mas.	Christ-mas.	Admit-ted.	Cured.	Inva-lided.	Remain-ing.
Gonorrhœa ..	11	111	7	1	30	29	—	1
Cystitis	4	4	1	—	9	3	6	—
Prostatitis	1	—	1	15	3	1	2	—
Stricture	17	13	13	13	58	34	24	—
Orchitis	21	17	11	1	62	56	6	—
Totals	54	145	33	30	162	123	38	1

The primary disease, gonorrhœa, is amenable to treatment, but the *sequelæ* are less so than usual.

Cystitis is very unmanageable and very much disposed to relapses, which induce vesical catarrh with incontinence of urine.

Prostatitis. In an hospital case, after very great suffering, relief was afforded by opening the abscess in the rectum, and passing a large catheter. Subsequently there was orchitis on the same side as the diseased prostatic lobe. A case occurred in Hong Kong, within my knowledge, in which the patient succumbed under pyæmic abscesses in the pelvis and abdomen, before the prostatic abscess had found an outlet.

Stricture becomes difficult of treatment, from a tendency to aggravation after exposure to the usual malarious influences, when the introduction of instruments is often followed by a regular ague paroxysm. This result was so frequent that I found it a safe rule to give ten grains of quinine and a little laudanum one hour previous to the operation, whenever there was any suspicion of previous exposure.

Orchitis is of frequent occurrence, and where it has not been actively treated in the first stage it often ends in abscess, and it would appear that the necessity of invaliding six cases was from that cause.

Syphilis has a very impairing influence on the effective numbers and individual stamina of our seamen on the China station. Although the total of genito-urinary diseases is almost entirely of venereal origin, yet even that large number, nearly 16 per cent. of the nosological table, with 14.8 per cent. of invalids, does not fully exemplify the enfeebling consequences of promiscuous sexual indulgence.

Every practitioner in China has seen that the syphilitic cachexy, having tainted the system, its eradication is very difficult, and that it has great influence on the result of the treatment in the climatic diseases, especially in dysentery. There is found, in practice, a lowering of the vital energies from syphilitic taint, that greatly lessens the chances of recovery.

The primary disease is frequently of the sloughing phagædenic form. Suppurating bubo is a common attendant, and it often becomes necessary to destroy the gland by escharotics to induce healing. In one instance, on incising a bubo, the gland was at once pressed out in a state of slough, having lost its vitality, while the integuments were yet unbroken.

Constitutional disease is not always warded off by the mercurial treatment of the primary sore. Very often a primary sore of insignificant character will be followed by a papular eruption, which, on a second outbreak, takes on the rupial character, which may be cured for a time by alteratives and tonics, but will recur with every derangement of the general health. Change of climate is the only remedy that can be depended on in such cases, but I am not satisfied that this effects a permanent cure if the patient returns.

Treatment should be mercurial, locally and generally, in the most trivial forms of venereal primary sores, a very mild ptyalism being kept up and allowed to subside slowly after the cure of the sore. The primary phagædenic sore is best treated by laying on thickly the levigated nitric oxyde of mercury, allowing it to remain until it is cast off by suppuration, and renewing it if the surface is still tawny. When buboes have sinuses undermining a gland or glands, free incisions are required, and destruction of the gland by escharotic lozenges containing the bichloride of mercury. In skin disease the best way is to treat by baths, and by Donovan's solution, with five grains of the iodide of mercury pill and a grain of opium at bed time. Cases are rare in which a liberal diet is not borne well during the treatment, —in most cases it is indispensable.

The severity of these diseases, and the consequent losses to the public services, have induced legislative interference, which places the sources under police regulations in our colony at Hong Kong. The enactment found many working difficulties, but with all its imperfections it has produced very beneficial results; and, when thoroughly enforced, it will, I doubt not, render this terrible bane of our soldiers

and sailors stationed at Hong Kong of less frequent occurrence and of milder form.

Diseases of Locomotive Organs.—Rheumatic affections form the bulk of this group. Unfortunately the mode of entering these cases on the hospital books affords no clue to the muscular, arthritic, or periosteal varieties of disease that are admitted under the general appellation "rheumatism," nor of the frequency of metastatic heart-diseases. The group has a value of 7.7 per cent. of the nosological total, of which value about 25 per cent. are unfit for further service. It may be inferred that this large ratio of invalids can only arise from periosteal disease, the *sequela* of syphilis, and from implication of the heart in arthritic cases. From this last cause the fatal case under head of rheumatism most likely occurred.

The drier months, from February to May inclusive, offer the greatest proportion of cases; the hot moist months, June to September inclusive, offer the least. At this last season the sudatory glands eliminate from the blood a large amount of lactic acid, which may possibly diminish the frequency of a disease that depends on the retention or excess of that agent in the system.

The very small proportion of the other diseases of the group, serves to indicate their rareness among European residents.

Diseases of the integuments and glands, etc., constitute 17 per cent. of total diseases, with a ratio of 10 per cent. of invalids—chiefly from abscess and scrofula, which last disease, with anasarca and scurvy, should, I think, have formed a distinct group. There are only a few notable species.

Phlegmon is a very distressing complaint to almost all new comers in spring and summer. In the form of furuncle, and sometimes of anthrax, it displays the direction of the determination of blood, and, it may be, of excess of organic acids, towards the outer surface of the body. A crop of boils is generally regarded as a salutary effort in those whose blood crasis has not become acclimatised to the hot moist summer season, and it is borne with the patience proverbial to the malady, under the conviction that its outbreak wards off climatic diseases. It is often preceded and attended by "lichen tropicus," another imputed salutary effort of somewhat milder type. Although these may be truly enough beneficial in removing excreta, yet from the restlessness and nervous irritation produced by them, attacks of ephemeral fever often result. Warm baths and

detergents are the best means of alleviating the irritation, and vegetable tonic-bitters, with soda, the most effectual means of correcting the blood-condition on which they seem to depend.

Abscess is very often of severe nature. Not having seen any of the "cold variety," I am disposed to consider acute suppuration in the areolar tissue as the ordinary cause, often setting in on the subsidence of fever. A mortality per centage of seven indicates the severity of these cases. I have treated the following varieties—parotid, subpectoral, axillary, lumbar, psoas, and prostatic, and have seen the deep-seated iliac, also, which will serve to prove that the affection is often of the greatest magnitude in that climate.

Ulcer is rarely sent to hospital, unless varicose or sloughing. The most frequent entries are in the Christmas quarter and January, which corroborates a statement by Dr. Wilson in his "Medical Notes," of some occult relationship between malarious fever, dysentery, and ulcer. The sloughing form is very frequent, and having once commenced in a ship is most difficult of eradication. The essential cause of this is not clear; it is ascribed variously to contagion, to ochlesis, or to something inherent in the ship's timbers. Of one thing I am satisfied, that its appearance is not justly indicative of any defective organisation of the crew, or of neglect of admitted sanitary precautions. I have seen it recur three times from slight injuries in the same individual. There is disordered health always, sometimes with a peculiar flush of the skin, bright-red mucous lining of the mouth or bleeding gums, and I have known it terminate fatally by hæmorrhagic purpura. The urine is always highly acid. I have obtained from it the very finest specimens of uric acid crystals, and sometimes the octohedral oxalates. In one case hæmaturia coexisted with the latter crystalline form.

In its treatment the system must be supported by good diet, stimulants, and anodynes; and in the local treatment, the solution of chloride of zinc, applied undiluted, and washed away by a stream of water, as soon as much pain is felt, and then replaced by a weaker solution, will be found to have most beneficial effects. As the sloughing is apt to extend rapidly by the aponeuroses and septæ, all undermined integuments must be laid open in full extent previously to applying the solution.

Adenitis is more common at the same periods as rheumatism, but generally indicates the scrofulous diathesis. It is

very amenable to treatment according to the table. I may here refer to a skin-disease not found in this table—leprosy —which exists among the Chinese in the same form as I have seen it in the Levant. Having noticed beggars in the streets of Hong Kong with this disease, I learned that they were outcasts as in Europe; and when walking not far from the main barracks, I came on their dwellings, on the slope of an unfrequented ravine. On examination of these unfortunate creatures I found the disease to be of the tuberculous variety. My ignorance of their language prevented my obtaining information. I thought it strange that, as outcasts by their own people, they found refuge near to our military head quarters.

Of the last group in the tabular arrangement I need say nothing, as the accidents of a martial service have no relation to the diseases of climate or locality.

I shall now close these cursory remarks by expressing a hope that those who practise, or have practised, medicine in the province of Canton may consider them faithful; and should they be the means of exciting the spirit in others to afford notes of their experience and opinions of the health-conditions prevailing there, my desire will be accomplished, as very much is still wanting to place theory and practice on secure ground.

P.S. The following note, *apropos* of certain observations, p. 218, has been forwarded by Dr. Smart, in a letter from Bermuda:—"I wished to express an opinion that 'Zymosis' —fermentation, should become a generic term; and as *pythogenetic* has been accepted to specify the morbific cause arising from *animal putrifaction*, I would venture to suggest the word *hydrogenetic*, as its correlative, restricted to the causes of *paludal* origin."

Climate of Hong-Kong. Table I.—*Atmospheric Pressure and Temperature.*

From 1853 to 1858 inclusive.	By mercurial barometer standard. Atmosphere pressure corrected for temperature.					By self-registering thermometers, corrected. Hour of notation—9 A.M. Day temperature, shade. Maximum thermometer (A.)						Night temperature. Minimum thermometer (B)					Approximations. Daily ranges, by difference of verages.			
	Highest Notation. Fine Weather. Northly. Gales. Winter.	Lowest notation. Typhoons. Summer. South gales. Winter.	9 A.M. Observation. Mean.	3 P.M. Observation. Mean.	Mean of Month.	Average temperature of day.	Highest notation in six years.	Mean of highest maxim.	Mean of lowest maxim.	Lowest notation in six years.	Average temperature of month in the shade.	Average temperature of night.	Highest notation in six years.	Mean of highest minima.	Mean of lowest minima.	Lowest notation in six years.	Difference. A. 1. = B. 1.	Mean Difference. A. 3. = B. 1. & A. 1 = B. 4.	Difference. A. 3. = B. 4.	Mean heat of sun's rays.
Months.	Inches.	Inches.	Inches.	Inches	Inches.	Deg.	Deg.	Deg.	Deg.	Deg.	Deg.	Deg.	Deg.	Deg.	Deg.	Deg.	Deg.	Deg.	Deg.	Deg.
January.....	30.437	29.728	30.170	30.081	30.125	63.33	78.	72.9	55.3	47.25	59.70	56.11	65.5	63.4	47.15	45.5	7.22	16.5	25.7	106
February ..	.591	.684	.118	.031	.075	64.81	77.	71.8	53.8	46.75	61.10	57.55	68.	63.8	46.5	39.	7.46	16.3	25.3	99
March	.486	.704	.054	29.970	.012	68.90	79.	77.15	58.	56.	65.00	61.14	74.	69.9	49.4	37.5	7.66	16.7	27.7	91
April.....	.147	.645	29.937	.853	29.895	75.75	86.	82.25	65.3	62.	71.95	68.13	79.	75.25	59.1	55.	7.12	15.5	23.	93
May	29.995	.493	.830	.759	.795	83.15	89.5	87.4	75.6	69.	79.50	75.9	81.5	80.4	68.8	59.	7.26	12.9	18.5	103
June	.966	.424	.719	.661	.690	85.03	90.	88.4	80.8	75.	81.75	78.54	84.	82.25	73.1	68.	6.49	11.	15.	108
July	.871	.287	.668	.617	.642	86.65	94.	90.9	80.6	75.	83.35	80.08	86.	84.5	76.3	74.5	6.58	10.2	14.5	115
August....	.898	.303	.664	.606	.635	85.62	94.5	90.	80.7	75.5	82.25	78.9	84.	82.	75.1	73.	6.72	10.7	15.	120
September .	30.009	.305	.754	.683	.718	84.92	93.5	89.	80.	76.	81.50	77.9	84.5	82.25	72.75	68.	7.02	11.5	16.3	116
October	.205	.489	.959	.825	.892	80.06	89.	86.5	73.5	67.5	76.60	73.14	81.	78.9	64.3	59.	6.92	14.9	22.3	107
November..	.352	.832	30.085	.999	30.042	74.35	82.	79.25	67.7	63.5	70.25	66.22	77.	71.5	60.25	56.	8.13	13.5	19.	105
December..	.448	.759	.122	30.041	.082	68.03	76.5	74.75	59.6	54.	64.50	61.00	69.	67.6	51.5	41.	7.03	15.2	23.3	105
Averages (six years).....			29.923	29.843	29.883	76.72	—	—	—	—	73.12	69.55	—	—	—	—	7.18	13.8	20.5	105.5
Highest mean, January ..			30.170	—	—	Average of day temperature.	Extreme heat.	Hot day.	Cool day.	Coolest day in six years.		Average of night temperature.	Hottest night in six years.	Hot night.	Cool night.	Extreme cold.	Settled weather.	Variable weather.	Extreme range.	
Lowest mean, July			—	29.606	—												Diurnal range.			
Mean annual range.....			—	—	0.564															
Highest observation, Feb.			30.591	—	—															
Lowest ditto, July			—	29.287	—															
Extreme range in 6 years .			—	—	1.204															

Climate of Hong-Kong. Table II.—*Humidity, Rainfall, Dewpoint, &c.*

From 1853 to 1858, inclusive.	Mean Monthly Values.											Mean Monthly Values.						
			Calculated by Glaisher's Tables. Dew-point Temperatures.									Observations on Pluviometer, 1854 to 1858. Rain-fall.						
												In Five Years.		Average.				
	Dry-Bulb Temperature.	Wet-bulb Temperature.	9½ A.M.	3½ P.M.	Day hours by Maximum Thermometer.	Monthly Mean.	Night hours by Minim. Thermometer.	Difference of Mean Dry-bulb, Mean Dew-point.	Elastic Force of Aqueous Vapour.	Weight of Vapour in a Cubic Foot.	Humidity. Saturation 100.	Rainy Days.	Quantity.	Rainy Days.	Quantity.	Maximum Monthly Quantity.	Minimum Monthly Quantity.	Maximum Daily Quantity.
Months.	Deg.	Deg.	Deg.	Deg.	Deg.	Deg.	Deg.	Deg.	Ins.	Gr.		No.	Ins.	No.	Ins.	Ins.	Ins.	Ins.
January.....	59.70	55.00	51.97	51.40	54.21	50.82	47.50	8.9	.371	4.16	72.4	13	3.296	2.6	.659	2.28	0.05	1.100
February	61.10	56.20	54.15	55.73	55.21	51.98	48.67	9.1	.387	4 34	72.5	23	8 340	4·6	1.668	2.950	0.33	1.650
March	65.00	61.45	50.30	57.52	62.	58.52	55.05	6.5	.491	5.44	80.5	42	12.778	8.4	2.555	5.240	0.268	.800
April	71.90	68.90	66.50	66.76	68.46	66.65	64.86	5.3	.652	7.08	83.0	44	27.849	8.8	5.569	11.189	1.785	6.650
May	79.50	75.90	73.98	73.48	75.6	73.45	71.30	6.1	.823	8.85	82.5	62	38.406	12.4	7.681	17.44	0.521	9.600
June	81.80	77.70	76.92	76.58	76.32	74.93	73.60	6.9	.866	9.22	80.5	85	105.916	17.0	21.183	30.09	16.30	14.100
July	83.35	80.10	77.14	79.17	80.9	77.96	75.00	6 4	.955	10.20	83.75	81	82.095	16.2	16.419	47.89	4.545	6.500
August	82.30	78.80	75.86	76.02	78.6	76.48	74.50	5.8	.910	9.75	82.5	77	69.967	15.6	13.993	19.542	6.60	6.510
September ..	81.50	77.10	74.96	75.41	77.0	74.20	71.44	7.2	.846	9.06	78.5	66	76.494	13.2	15.398	24.820	3.10	6.349
October.....	76.60	71.80	68.52	69.87	71.57	68.48	65.42	8.1	.696	7.54	75.8	30	27.521	7.5	6.880	12.33	.05	6.500
November....	70.25	64.80	61.33	63.19	63.22	60.54	58.10	9.7	.528	5.77	71.2	11	3.974	2.2	.796	3.159	.00	1.320
December....	64.50	60.00	55.58	58.32	60.29	56.80	52.34	8.2	.454	5.05	74.5	11	1.870	2.2	.375	1.870	.00	.425
Averages ..	73.12	68.97				65.85		7·35	.665	7.20	78.13			110.7	93.176			

TABLE III.—*Comparison of the Climates of* HONG-KONG, MACAO, and CANTON.

Hong-Kong, from 1853 *to* 1858; *Macao, through several years, by* Mr. BEALE.

Hong-Kong, in 1858; *Canton in* 1858, *by* Dr. BEKKER.

AVERAGES OF MONTHLY VALUES.

MONTHS.	Of Heat, By Self-Registering Thermometers.								Of Rain, by Pluviometer.		Of Heat, By Self-Registering Thermometers.								Of Rain, by Pluviometer.		Of Dew-Point by Dry and Wet Bulbs.	
	Of Daily Max. Obs.		Of Daily Min. Obs.		Of Daily Means.		Of Daily Range.				Of Daily Max. Obs.		Of Daily Min. Obs.		Of Daily Means.		Of Daily Range.					
	Hong-Kong.	Macao.	Hong-Kong.	Macao.	Hong-Kong.	Macao.	Hong-Kong.	Macao.	Hong-Kong.	Macao.	Hong-Kong.	Canton.	Hong-Kong.	Canton.	Hong-Kong.	Canton.	Hong-Kong.	Canton.	Hong-Kong	Canton.	Hong-Kong.	Canton.
	Deg.	Deg.	Deg.	Deg.	Deg.	Deg.	Deg.	Deg.	Inches.	Inches.	Deg.	Deg.	Deg.	Deg.	Deg.	Deg.	Deg.	Deg.	Inches.	Inches.	Deg.	Deg.
January ..	63.33	57.	56.11	45.	59.70	51.	7.22	12.	.659	.675	65.1	64.7	56.2	54.5	60.65	59.6	8.9	10.2	2.270	..	53.5	..
February .	64.81	58.	57.55	45.	61.10	51.5	7.46	13.	1.668	1.700	64.2	66.6	53.4	53.9	58.8	60.2	10.8	12.7	2.950	..	48.1	..
March ...	68.90	71.	61.14	60.	65.00	65.5	7.66	11.	2.555	2.150	67.	64.9	59.6	57.4	63.3	61.2	8.4	7.5	5.240	..	56.8	..
April	75.75	76.	68.13	69.	71.95	72.5	7.12	7.	5.569	5.675	74.8	77.1	65.9	66.3	70.35	71.7	8.9	11.15	7.309	3.66	64.1	67.
May	83.15	78.	75.9	73.	79.50	75.5	7.26	5.	7.681	11.850	81.2	81.3	72.5	73.7	76.85	77.5	8.7	7.4	11.055	8.28	72.2	75.7
June	85.02	84.	78.54	79.	81.75	81.5	6.49	5.	21.183	11.100	84.3	86.1	77.2	76.2	80.1	81.1	7.1	9.8	18.478	8 53	75.8	78.7
July	86.65	88.	80.08	84.	83.35	86.	6.58	4.	16.419	7.750	86.4	89.4	81.2	78.3	83.8	83.1	5.2	11.1	4.545	2.79	79.5	79.8
August ..	85.62	86.	78.9	83.	82.25	84.5	6.72	3.	13.993	9.900	87.48	88.8	78.48	77.9	82.95	83.8	9.	11.2	6.600	7.52	77.2	10.9
September	84.92	84.	77.9	79.	81.50	81.5	7.02	5.	15.398	10.925	85.53	87.3	77.63	77.2	81.58	82.2	7.9	10.1	3.100	6.17	75.	77.6
October ..	80.06	76.	73.14	70.	76.60	73.	6.92	6.	6.880	5.500	81.75	84.	75.5	70.9	78.62	77.5	6.25	13.1	.050	.79	71.5	72.7
November	74.35	68.	66.22	61.	70.25	64.5	8.13	7.	.796	2.425	74.63	78.5	66.00	58.9	70.31	68.7	8.63	19.7	.000	.00	62.6	55.4
December	68.03	63.	61.00	52.	64.50	57.5	7.03	11.	.375	.975	70.13	73.6	63.25	58.7	66.69	66.2	6.88	14.9	.120	.04	60.9	59.7
Averages .	76.72	74.	69.55	66.6	73.12	70.37	7.18	7.41	93.176	70.625	76.87	78.52	68.90	66.99	72.83	72.75	8.05	11.57	51.248	37.78	70.98	71.94

HONG-KONG.—*Nosological Table of Diseases, &c., treated in the Royal Naval*

DISEASES.	ADMISSIONS IN EACH MONTH.												TOTALS OF EACH DISEASE.				
	Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Admitted.	Discharg'd to their Ships.	Invalided to England.	Dead.	Remaining for Treatment.
Fevers.	Lady Qr.			Midsmr. Qr.			Michaelm. Qr.			Xmas Qr.							
Continued	9	15	16	7	28	53	84	78	46	38	35	20	429	356	53	19	1
Remittent	4	2	8	2	1	6	20	15	6	23	7	12	106	85	4	16	1
Intermittent	6	9	8	7	6	6	4	2	8	10	4	6	71	63	8	..	..
Small-Pox	2	4	2	8	4	..	..	..	..	..	..	..	15	13	..	2	..
Totals	21	30	29	19	39	65	108	95	60	71	46	38	621	517	65	37	2
Of Brain, Spinal Cord, and Nerves.																	
Apoplexy	..	..	..	..	..	..	..	..	1	..	1	..	2	..	..	2	..
Paralysis	..	3	1	2	1	2	2	2	1	2	2	2	20	6	8	5	1
Epilepsy	..	3	3	3	1	1	..	4	2	2	2	4	25	9	15	1	..
Encephalitis	1	1	..	..	..	..	..	1	1	..	1	..	5	1	3	1	..
Insalatio	..	..	..	..	..	..	..	8	1	..	..	..	9	9	..	..	..
Cephalalgia	..	..	..	1	1	1	..	..	1	2	1	..	7	4	3	..	..
Vertigo	..	..	..	..	1	1	..	..	..	..	..	..	2	1	1	..	..
Insanity	1	..	2	..	1	1	1	1	1	1	3	1	13	2	11	..	..
Hypochondriasis	..	..	..	..	..	..	..	..	2	..	..	2	4	..	4	..	..
Delirium Tremens	..	2	2	2	3	2	1	1	2	4	4	4	27	15	4	8	..
Neuralgia	..	1	..	..	..	..	..	3	..	..	..	..	4	2	2	..	..
Hydrophobia	..	..	1	..	..	..	..	..	..	..	..	..	1	..	..	1	..
Totals	2	10	9	8	8	8	4	20	12	11	14	13	119	49	51	18	1
Of the Organs of Sense.																	
Ophthalmia	..	2	3	3	2	1	40	..	2	1	..	1	55	50	4	1	..
Amaurosis	..	1	..	2	1	..	1	..	..	..	..	..	5	1	4	..	..
Hemeralopia	..	..	..	..	..	..	..	..	1	..	..	..	1	1	..	..	..
Cataract	..	..	..	..	..	..	..	..	..	..	1	..	1	1	..	..	..
Otitis	..	..	..	1	..	..	..	..	1	..	..	..	2	1	1	..	1
Deafness	..	..	1	..	..	..	..	..	..	..	..	..	1	1	..	..	..
Totals	0	3	4	6	3	1	41	0	4	1	1	1	65	54	9	1	1
Of the Respiratory Organs.																	
Bronchitis	10	12	8	13	8	12	12	8	5	10	12	10	120	74	43	3	..
Pleuritis	4	..	1	1	5	..	..	..	..	2	1	2	16	13	3	..	..
Pneumonia	5	1	..	2	6	5	4	..	4	1	1	3	32	20	3	9	..
Hæmoptysis	..	..	1	4	2	1	1	2	1	1	3	2	18	10	8	..	..
Phthisis	5	7	7	11	9	6	7	8	4	15	10	9	98	13	54	30	1
Asthma	..	3	..	..	1	2	..	1	1	1	..	1	10	3	7	..	..
Epistaxis	..	1	..	..	..	..	..	..	..	..	..	..	1	1	..	..	..
Totals	24	24	17	31	31	26	24	19	15	30	27	27	295	134	118	42	1
Of the Heart, &c.																	
Palpitation	3	1	3	3	1	..	2	3	2	5	3	2	33	16	15	..	2
Syncope	1	..	..	..	..	..	..	..	..	..	..	..	1	1	..	..	..
Angina	..	..	..	..	..	..	..	..	..	..	1	..	1	1	..	..	..
Pericarditis	1	..	..	..	..	..	1	..	1	2	..	..	5	3	1	1	..
Carditis	..	..	..	..	..	..	1	..	..	..	..	..	1	..	1	..	..
Diseased Heart	2	..	..	2	3	1	2	1	..	..	2	..	13	4	7	2	..
Totals	7	1	3	10	4	1	6	4	3	7	6	2					
Of the Liver & Spleen.																	
Jaundice	1	..	1	..	1	1	..	..	..	..	..	1	5	5	..	..	..
HepaticCongestion	..	..	..	1	..	1	..	..	..	..	..	..	2	2	..	..	..
Hepatitis	8	1	6	10	8	6	11	7	4	8	8	14	91	50	21	20	..
Splenitis	..	..	1	..	1	..	4	1	..	2	..	..	9	4	5	..	..
Totals	9	1	8	11	10	8	15	8	4	10	8	15					
Of the Organs of Digestion.																	
Stomatitis	..	..	..	..	..	..	..	..	..	1	..	..	1	1	..	..	..
Tonsillitis	1	..	..	1	..	1	..	1	..	..	..	..	4	4	..	..	..
Gastritis	2	3	..	2	1	1	1	..	1	1	2	..	14	8	4	2	..
Dyspepsia	1	..	1	2	2	6	5	7	2	7	1	..	35	28	7	..	..
Tænia	..	..	..	..	..	1	..	..	..	..	..	..	1	1	..	..	..
Peritonitis	1	1	1	2	..	..	1	..	..	..	..	1	7	5	..	2	..
Ascites	..	2	..	1	1	..	2	..	..	..	1	..	7	2	3	2	..

Hospital, between 1st July 1846, and 30th June 1859.

Diseases.	ADMISSIONS IN EACH MONTH.												TOTALS OF EACH DISEASE.				
	Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Admitted.	Discharg'd to their Ships.	Invalided to England.	Dead.	Remaining for Treatment.
Digestive Org. (cont.)	Lady Qr.			Midsmr. Qr.			Michaelm. Qr.			Xmas. Qr.							
Tympanitis	1	..	..	..	..	..	..	..	..	..	..	..	1	..	..	1	..
Enteritis	..	..	..	..	1	..	1	1	1	1	2	1	8	4	2	2	..
Dysentery	68	53	69	45	46	85	70	103	58	139	165	108	1009	538	257	210	4
Diarrhœa	25	23	18	12	32	32	42	33	13	36	33	39	336	229	80	23	6
Cholera	..	..	..	..	..	3	3	1	..	..	..	..	7	3	1	3	..
Constipation	2	..	..	..	1	1	1	..	1	1	1	..	8	8	..	..	..
Colic	..	1	..	..	..	2	..	..	..	1	..	..	4	3	1	..	..
Hæmorrhoids	1	..	..	..	2	1	..	..	..	1	1	1	7	6	1	..	..
Fistula	1	1	3	2	3	1	1	3	2	..	1	2	20	13	7	..	..
Totals....	103	84	92	67	89	134	127	149	78	188	207	153	1471	853	363	245	10
Genito-Urinary Orgs.																	
Nephritis	1	..	..	..	..	..	1	..	..	..	..	..	2	1	1	..	..
Albuminuria	..	1	..	..	..	..	..	..	..	..	..	..	1	..	..	1	..
Hæmaturia	1	..	..	..	..	..	..	..	..	..	1	..	2	1	1	..	..
Diabetes	..	..	..	..	..	..	..	..	..	..	2	..	2	..	1	1	..
Cystitis	1	1	2	2	1	1	1	..	..	..	..	..	9	3	6	..	..
Prostatitis	..	1	..	..	..	..	..	..	1	..	..	1	3	1	2	..	..
Enuresis	..	..	1	..	..	..	..	..	..	2	1	..	4	1	3	..	..
Stricture	6	7	4	5	2	6	4	7	2	5	3	7	58	34	24	..	..
Orchitis	8	6	7	6	5	6	7	3	1	5	4	4	62	56	6	..	..
Hydrocele	..	3	..	2	..	1	1	..	..	..	1	1	9	8	..	..	1
Hæmatocele	..	..	..	..	..	1	..	..	..	..	..	..	1	1	..	..	..
Varicocele	..	..	..	..	1	..	..	..	..	1	..	1	3	2	1	..	..
Gonorrhœa	4	2	5	1	4	6	3	3	1	1	..	..	30	29	..	..	..
Syphilis	37	44	50	58	40	41	43	28	19	42	47	69	508	483	73	3	9
Totals....	108	65	69	74	53	62	60	41	24	56	59	33	754	620	118	5	10
Organs of Locomotion																	
Rheumatism	17	49	42	37	33	23	21	26	11	29	25	36	349	262	83	1	3
Synovitis	3	..	..	1	1	1	..	..	..	..	2	..	8	7	..	1	..
Coxalgia	..	..	..	..	..	1	..	1	..	..	..	..	2	..	1	1	..
Periostitis	..	..	2	..	..	1	..	..	..	..	..	..	3	3	..	..	..
Exostosis	..	..	..	..	..	1	..	1	..	..	..	..	2	1	1	..	..
Caries	1	1	..	1	..	..	..	..	..	1	..	..	4	..	4	..	..
Totals....	21	50	44	39	34	27	21	28	11	30	27	36	368	273	89	3	3
Of the Integuments, Glands, &c.																	
Phlegmon	1	..	1	2	3	4	2	1	..	3	2	4	23	22	1	..	..
Erysipelas	..	1	1	..	1	..	..	1	..	..	..	2	6	6	..	..	..
Abscess	3	1	3	2	4	4	6	2	7	9	4	1	46	32	11	3	..
Ulcer	29	12	16	25	18	13	25	18	18	72	33	25	304	281	23	..	..
Bubo (Symp.)	15	16	13	7	11	6	4	8	..	3	4	10	97	94	3	..	..
Scrofula	..	2	2	1	2	..	2	1	1	4	3	..	18	7	10	..	1
Herpes	..	..	..	..	..	..	1	..	..	..	..	..	1	1	..	..	..
Psora	..	..	1	..	..	..	..	..	..	..	..	..	1	1	..	..	..
Eczema	1	..	..	2	1	..	1	..	..	..	..	..	5	4	1	..	..
Porrigo	..	..	..	..	..	..	..	1	..	..	..	..	1	1	..	..	..
Gangrene	..	..	..	..	..	..	..	..	..	..	1	..	1	1	..	..	..
Anasarca	..	..	1	..	..	..	..	2	..	..	..	..	3	1	2	..	..
Scurvy	..	..	..	1	..	..	..	..	..	..	..	1	2	2	..	..	..
Totals....	49	32	38	40	40	27	41	34	26	91	47	43	508	453	51	3	1
Casualties.																	
Gunshot Wounds	1	3	..	1	4	23	21	7	2	..	7	27	96	46	34	16	..
Wounds	8	10	3	12	4	1	3	9	9	2	9	8	78	58	15	5	..
Fractures	6	5	5	3	4	4	3	6	3	3	4	6	52	32	15	5	..
Dislocations	..	..	..	..	..	..	1	..	..	..	..	..	1	1	..	..	..
Sprains	1	..	2	2	3	..	..	..	..	..	..	1	9	6	2	..	1
Contusions	3	2	2	2	3	5	1	..	..	2	3	1	24	21	3	..	..
Hernia	..	1	..	..	..	..	1	1	..	..	..	..	3	1	2	..	..
Amputations	3	..	1	1	..	..	1	1	..	1	3	2	13	3	10	..	..
Burns	18	..	2	..	..	4	..	13	..	..	2	3	39	31	2	6	..
Concuss'n of Brain	..	..	1	..	..	..	..	..	1	..	..	..	2	2	..	..	..
Totals....	40	21	16	21	18	37	31	37	15	8	25	48	317	201	83	32	1
Debility	2	2	6	6	5	5	10	9	1	6	3	4	59	36	22	1	..

Summary of preceding Table.

Diseases.	ADMISSIONS IN EACH MONTH.												TOTALS OF EACH DISEASE.					TOTALS OF EACH GROUP OF DISEASES.					
	Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Admitted.	Discharg'd to their Ships.	Invalided to England.	Dead.	Remaining for Treatment.	Admitted.	Discharged to their Ships.	Invalided to England.	Dead.	Remaining for Treatment.
Abstract of Classes. Monthly Admissions, & Annual Results.	Lady Qr.			Midsmr. Qr.			Michaelm. Qr.			Xmas. Qr.													
Fevers	19	26	27	16	25	65	108	95	60	71	46	38	606	504	65	35	2	871	201	83	32	1
„ (Eruptive)	2	4	2	3	4	..	..	..	..	..	..	..	15	13	..	2	..	59	36	22	1	..
Dis. of Nerv. Syst.	2	10	9	8	8	8	4	20	12	11	14	18	119	49	51	18	1					
„ Org. of Sense	..	3	4	6	3	1	41	..	4	1	1	1	65	54	9	1	1					
„ „ Respiration	24	24	17	31	31	26	24	19	15	30	27	27	295	134	118	42	1					
„ „ Circulation	7	1	3	10	4	1	6	4	3	7	6	2	54	25	24	3	2					
„ „ Biliary, &c.	9	1	8	11	10	8	15	8	4	10	8	15	107	61	26	20	..					
„ „ Digestion	103	84	92	67	89	134	127	149	78	188	207	151	1471	853	363	245	10					
„ „ Genito-Ur'y	108	65	69	74	53	62	60	41	24	56	59	53	754	520	118	5	11					
„ „ Locomotion	21	50	44	39	34	27	21	28	11	30	27	36	368	273	89	3	3					
„ „ Integum'nt'y	49	32	38	40	40	27	41	34	26	91	47	43	508	453	51	3	1					
Casualties	40	21	16	21	18	37	31	37	15	8	25	48	317	201	83	32	1					
Cachexies	2	2	6	6	5	5	10	9	1	6	3	4	59	36	22	1	..					
Totals, Admitted	386	323	335	332	334	401	488	444	258	509	470	468	4738	..	..	..	..					
„ Cured	263	223	240	236	237	269	351	311	183	326	299	328	..	3276	..	..	..					
„ Invalided	84	75	65	71	74	52	90	87	50	135	118	88	..	..	1019	..	..					
„ Dead	39	24	28	21	20	27	37	46	20	48	53	47	..	..	..	410	..					
„ Remaining	..	1	2	4	3	23	..	..	..	..	..	..	..	..	..	..	33					

Abstract of Quarterly Returns.	Admitted.	Discharged to their Ships.	Invalided to England.	Dead.	Remaining for Treatment.
Lady Qr.	1044	726	224	91	3
Midsmr. Qr.	1067	742	227	68	30
Michael. Qr.	1185	885	227	103	..
Xmas. Qr.	1442	953	341	148	..
	4738	..	..	..	..
	..	3276	..	..	..
	..	..	1019	..	..
	..	..	..	410	..
	..	..	..	..	33

W. R. E. SMART.

ON FEVER IN THE ZAMBESI.

A NOTE FROM DR. LIVINGSTONE TO DR. M'WILLIAM.

Transmitted by Captain WASHINGTON, R.N., F.R.S., Hydrographer to the Admiralty.

Read June 3rd, 1861.

In the typical cases given in Dr. M'William's "Medical History of the Niger Expedition", the gall-bladder was found distended with black bile; and, if my memory does not deceive me, most of the cases treated with quinine at an early period of the disease either recovered, or were subjected to the milder or intermittent form of fever.

In 1850 I adopted the plan of giving quinine mixed with a purgative as the first step of the treatment, and was successful in the cases of two of my own children and an English party whom we found at Lake Ngami, and of whom one had died before our arrival. I have lost the notes of my reasons for adopting the practice, but I have been successful in every case I have met with since. The prescription employed is—Resin of jalap, and calomel, of each eight grains; quinine and rhubarb, of each four grains; mix well together, and when required make into pills with spirit of cardamoms: dose from ten to twenty grains.* The violent headache, pains in the back, etc., are all relieved in from four to six hours; and with the operation of the medicine there is an enormous discharge of black bile,—the patient frequently calls it blood. If the operation is delayed, a dessert-spoonful of salts promotes the action. Quinine is then given till the ears ring, etc. We have tried to substitute other purgatives instead of the resin, jalap, and calomel, but our experiments have only produced the conviction that aught else is mere trifling. No strength is lost in our march up the river of six hundred miles on foot. A European would be stricken down one day, and the next, after the operation of the remedy, would resume his march on foot. In some very severe attacks it was necessary for the patient to travel upon a donkey, but after two or three days he would prefer to tramp it.

* Since the paper was read, Dr. McWilliam has received through the Foreign Office the following amended formula of Dr. Livingstone's prescription—viz.: "Take of resin, of jalap, and of rhubarb, six or eight grains; of calomel and quinine four grains each: mix well in a mortar, and preserve for use." (The rest is correct.)

We tried Warburg's tincture, which has a great reputation in India, but it causes profuse sweating, and does not cure the disease; the strength is also impaired. We had a good supply, by the kindness of one of our nobility, but I am compelled to say that it did not answer our expectations. The daily use of quinine is no preventive. We have seen many cases occur when the person was on the verge of cinchonism.

I employed the foregoing remedy with success on the west coast, but made no fuss about it more than make a general statement in the "Missionary Travels." I was not quite sure that our fever was identical with that Dr. M'William encountered in the Niger, but the melancholy fate of a party of missionaries at Linyanti, where six out of nine Europeans and four native attendants perished in the space of three months, makes me fear that it is the same complaint as that which destroyed the officers of Commodore Owen in the Zambesi, those of Captain Tuckey in the Congo, and the crews of the Great Niger Expedition in that river. My companions, Dr. Kirk and Mr. C. Livingstone, entertain the same opinion of the value of our pills as I do. We wrote a paper for one of the medical journals. But the above sad case makes us anxious that the remedy should become more extensively known than it has been, and I do not know a better plan for effecting this than by communicating it to Dr. M'William.

Those who may try the remedy will do well to remember that the above doses are for strong adults.

I cured myself and native companions in this way during my long journeys between 1852 and 1856, and that the remedy has no bad effect on the system may be inferred from the fact that I have had no regular attack of fever since my return. I have had little illness, probably from exposure to malaria in its most intense forms, but nothing like what I formerly experienced; and I am of opinion that, what we were all taught, not to give quinine till we had used the preliminary measure of relieving the bowels was a mistake.

Query—Might not the remedy be applied to some of the fevers at home that arise in unhealthy localities? Around every village in this country there is a very large collection of human ordure during the dry season; this is swept into the rivers by the heavy rains, and you may guess the effect from hundred of thousands of villages. The natives here do not drink it, as the natives do on the banks of the Thames, but make holes in the sand to draw from. Possibly this has as much to do with the origin of fever as it has at home.

DAVID LIVINGSTONE.

Tette, 28th November, 1860.

I give a specimen of the difference between dry and wet bulb, Victoria Falls, 24th September, 1860.

In shade, 9 A.M.	Air.....87°	Difference, 28°	
	Wet bulb ..59°		
„ 12 „	Air.....96·5°	Difference 33·5	
	Wet bulb ..63°		
„ 3 P.M.	Air.....96°	Difference, 36°. Once the difference was 40°.	
	Wet bulb ..60°		

The greatest difference, Dr. M'William observes, was I believe 16°; generally it was 6° or 7°. D. L.

The temperature of the dew point in the three observations respectively are, according to the formula of Glaisher, 42°, 50·2°, and 54°. [J. O. M'W.]

Dr. M'WILLIAM observed that anything coming from Dr. Livingstone was sure to command attention and interest, and that he therefore had had great satisfaction in bringing his brief communication before the society. He (Dr. M'William) had not been in any of the rivers on the east coast; but he had treated fever off the coast of Mozambique, and at Madagascar, which he found of a much more tractable nature than that which he had encountered on the west coast, more especially in the Niger. But from what he had learned of the traders at Mozambique, he feared that the rivers on the east coast were not much less inimical to European life than those of the west coast. The Zambesi was about twenty-five degrees south of the Niger; but there seemed to be no defect of heat—that important element in the causation of fever—in the Zambesi, according to the day's meteorological observations which Dr. Livingstone had appended to his paper. The difference between the temperature of the dry and wet bulb thermometers was far beyond anything met with in the Niger, and was indicative of unwonted dryness of the atmosphere in the Zambesi. With regard to the treatment so successfully employed by Dr. Livingstone, the principle was of course not new, although he was not aware that the precise formula of that eminent traveller had hitherto been used; and as other purgatives than jalap, calomel, and rhubarb, in combination with quinine, had failed in Dr. Livingstone's hands, it was desirable that the prescription he recommended should have further trial. To this end, he (Dr. M'William) would endeavour to give it all possible publicity. Dr. Livingstone had alluded to the mortality in other African expeditions, and it might not be uninteresting to the society that he (Dr. M'William) should briefly recapitulate the losses sustained in the expedition to the Congo in 1816; to the Zambesi, from Captain Owen's ship, in 1823; to the Niger, under Laird,

Lander, and Oldfield, in 1832; and to the Niger, under Captain Trotter, in 1841-42. He should also state the mortality of the *Eclair* in 1845, and, although not in chronological order, the dreadful loss sustained by two detachments of soldiery at the Gambia in 1825; as also that suffered by Mungo Park's party, in the last journey of that great traveller into the interior of Africa.

Tuckey's expedition to the Congo in 1816.—Captain Tuckey in H.M.'s ship *Congo*, entered the river Congo, on the south-west coast of Africa, in latitude 6° S., on the 6th of July, 1816. His crew at this time consisted of—

Officers - - - - -	7	
Naturalists, etc. - - - -	5	
Petty officers, seamen, and marines -	40	52
Two natives of the Congo - -		2
		54

After pursuing the voyage for some way up the river, a party of thirty proceeded on a land expedition beyond the cataracts of the river. Of this party, fourteen died of fever, and four died on board the *Congo*—all within the space of three months. One man also died from the effects of river fever after leaving the river. Total loss, nineteen.

Of 7 officers - - - -	3	died.
„ 5 naturalists, etc. - - -	4	„
„ 40 petty officers, seamen, and marines	12	„
	19	

Mr. M'Kerrow, the medical officer, describes the weather as pleasant, the thermometer seldom exceeding 76° Fahr., or being lower than 60°, with scarcely any rain, and the atmosphere dry. He describes the fever as an intense remittent, with, however, black vomit in some cases. Bleeding (contrary to the accounts of the missions to the Congo by Carli, Merolla, and others) was unsuccessful as a remedy. Cathartics were useful; and calomel given so as to affect the constitution rapidly, was of great service, followed up by wine and bark.

The canoe expedition, from Captain Owen's ship, up the Zambesi, referred to by Dr. Livingstone, consisted of Lieut. Browne, Mr. Forbes (midshipman), Mr. Kilpatrick (assistant-surgeon), and two black servants. They left Quilimane on the 23rd of July, 1823. On the 3rd of August, being then on the Zambesi, Mr. Forbes was taken with fever, and died on the 15th. On the 27th of August, Lieut. Browne was seized, and died on the 5th of September. Mr. Kilpatrick was attacked on the 1st of September, and was likely to recover; but some

imprudence caused a relapse, which proved fatal to him on the 28th of October. The blacks got out of the river safe.

Expedition to the Niger in 1832.—In the expedition to the Niger in the *Quorra* and *Alburkah* steam-vessels, under M'Gregor Laird, Lander, and Oldfield, there were in the first-named vessel, besides Kroomen engaged on the coast, a crew of twenty-six persons, while the *Alburkah's* crew consisted of fourteen only. After some delay at Sierra Leone and Cape Coast, both vessels entered the Nun branch of the Niger on the 18th of October, 1832. The captain and engineer of the *Quorra* died immediately after the vessel entered the river. The boatswain of the *Alburkah* also sank under fever at the same time. On the 12th of November, when the vessels were at Damagû, some way above the delta, many in both vessels were laid down with fever; and on the 14th, one European only in the *Quorra* was fit for duty. On the 21st of November the *Quorra* had lost thirteen, and the *Alburkah* two men. On the 5th of December there remained alive in the *Quorra* four persons only, including Mr. Laird. This gentleman, after various relapses in his own person, and the loss of others of his crew, descended the Niger, and reached the sea on the 19th August, 1833. The *Alburkah* returned to the mouth of the river in November of the same year.

The total deaths in the *Quorra* were	-	24
Survivors - - - - -	-	5
		—29
Deaths in *Alburkah* - -	-	15
Survivors - - - - -	-	4
		—19

Besides these, eight or nine Kroomen died from poison.

The chief part of this mortality occurred within three months after the vessels began to ascend the river. Owing to the death of Dr. Briggs at an early period of the expedition, we have no account of his treatment on board the *Quorra;* but M'Gregor Laird acquaints us that Lander bled and blistered the sick, and gave emetics and purgatives at the outset of the disease. Blisters to the head appeared to do good service in some cases, as in Mr. Laird's own case. Mr. Oldfield administered purgatives, shaved the head, and applied cold lotions. He also used mercury until slight ptyalism was produced.

Expedition to the Niger in 1841-42.—In the expedition of 1841, under the command of Captain Trotter—consisting of the iron steam vessels *Albert, Wilberforce,* and *Soudan*—the vessels entered the Nun branch of the Niger on the 13th of August, 1841, and commenced the ascent of the river on the

19th. At this time the strength of the expedition was as follows:—

	Officers, Seamen, and Marines (Whites).	Men of Colour, various nations.	Blacks, entered on coast.
Albert	62	15	76
Wilberforce	56	7	39
Soudan	27	3	18

The expedition was at Ibu, below the apex of the delta and upwards of one hundred miles from the sea, on the 26th of August; and at Iddah, the capital of Egganah (where rock—ferruginous sandstone—was first seen), on the 2nd of September. Fever broke out in the *Albert*, and also simultaneously in the other vessels, on the 4th of September, and ceased not until it had paralysed the whole expedition. On the 10th, notwithstanding the persistence of the disease, the expedition was at the confluence of the Niger and Tchadda. Here, however, it was found necessary to despatch the *Wilberforce* and *Soudan* to the sea, with their own sick and those of the *Albert*, on the 19th. The *Albert* proceeded upwards on the 21st, and reached Egga, the Nufi capital, on the 28th of September. On the 4th of October there remained fit for duty, one seaman two marines, Mr. Willie, mate, Dr. Stanger, and Dr. M'William. It was then resolved to return to the sea, which was reached with difficulty on the 14th, and Fernando Po on the 17th of the same month.

	White strength.	Loss.
The *Albert*, which was sixty-four days in the river, lost by death in the River, at Fernando Po, and Ascension, twenty-three persons - - - - -	62 ..	23
The *Wilberforce*, forty-five days in the river, lost by death on board and at Fernando Po, nine persons - -	56 ..	9
The *Soudan*, which was in the river forty days, lost ten men from fever. - - - - - -	27 ..	10
	145	42

Of the men of colour entered in England (twenty-five), eleven were attacked with fever in the river, but none died. Of one hundred and thirty-three blacks entered at Sierra Leone, not one was even attacked.

Every precaution which human ingenuity could suggest was taken to ensure the health of this expedition: provisions were of the best kind, preserved meats and vegetables, and medical comforts of every description were supplied. The ships were ventilated upon Dr. Reid's plan; coffee was supplied to the crews early in the morning, and quinine in wine was liberally administered. The treatment consisted of purgatives, diaphoretics, and quinine, the last often early in the disease, either combined

with calomel or by itself; blisters to the nape of the neck were sometimes beneficial; general bleeding could not be tolerated.

Case of the "Eclair" in 1845.—The mortality on board of the *Eclair* in 1845 was as follows. Crew, one hundred and forty:—

	Deaths.
From April 1st to June 30th, off the island of Sherboro, west coast of Africa, several of the boats having been up the river - -	10
From July 1st to Aug. 31st, at Sierra Leone, the Gambia, and Boa Vista, Cape de Verds - - - - - -	16
In a crew now reduced to 114, from Sept. 1st to the 21st, at Boa Vista and Madeira; or at the rate of about 29 per cent. in three weeks - - - - - - - -	33
From Sept. 21st to Oct. 3rd, between Madeira and England, and at the Motherbank and Standgate Creek - - - -	10
	69

Dr. Baikie entered the Niger by the Nun branch in the *Pleiad* iron screw steamer, on the 12th of July, 1854.

The *Pleiad's* complement comprised—twelve whites and fifty-four people of colour, including thirty-three Kroomen: total sixty-six persons.

She remained in the river five months, employed in surveying and in other scientific pursuits; besides holding commercial intercourse with the natives. Dr. Baikie and some others had attacks of fever while in the river, which, in some cases, returned in the form of intermittent, months after they had left it. There were also some scorbutic cases, but all came out of the river alive. Dr. Baikie attributed the comparative immunity of the crew to the use of quinine as a prophylactic, which, in accordance with his instructions drawn up by Dr. Bryson, and in conformity with the recommendation contained in Dr. M'William's *Medical History of the Niger Expedition*, p. 188, he caused to be administered to the crew twice a day, and undoubtedly with good effect. Dr. M'William concluded by saying that, however unwilling he was to say a single word unfavourable to quinine as a preventive of fever, truth compelled him to state that, in this respect, it had not maintained its reputation in the hands of Dr. Livingstone—a circumstance suggestive of the necessity of caution in dogmatizing too hastily upon the powers of any remedy.

Summary of Mortality in the Expeditions respectively.—The mortality in the *Congo* within three months was 36·54 per cent.

In Lander and Laird's expedition of 1832, in less than two months, 81·25 per cent.

In the expedition to the Niger, under Captain Trotter in 1841-2, in which nearly the whole mortality from fever took

place within two months, and all within four months, 28·96 per cent.

In the *Eclair* in six months, 49·28 per cent.

But these heavy rates of mortality are surpassed by what took place at the Gambia in 1825, where a detachment of one hundred and eight men (whites) arrived at the end of May, just as the rainy season commenced. Of this number there remained alive on the 21st of September of the same year, twenty-one, the mortality having been within the space of four months 82·85 per cent.

Another detachment of ninety-one men, which in the meantime had been on board of a transport at the anchorage, and which while there did not lose a man, was landed about the end of September, and made up the force to one hundred and twelve. Of this number, there had perished of fever, sixty-one; and of other diseases, including six from fever following punishment, twelve; total, seventy-three, or at the rate of 65·17 per cent. during less than three months.

During this fearful mortality, a detachment of from forty to fifty black soldiers of the 2nd West India Regiment lost only one man, and had seldom any in hospital.

To go back still further. Mungo Park, on his second journey to the interior of Africa, left the Gambia on the 28th of April, 1805, having with him, besides his brother-in-law—Mr. Anderson, Mr. Scott, and Lieut. Martin, thirty-four soldiers, four carpenters, and two seamen—in all forty-four Europeans. He did not reach the Niger at Bambakoo until the 19th August, far into the rainy season, having had to traverse five hundred miles of a country fertile of disease, and beset with danger. Dysentery and fever had by this time made sad havoc amongst his people, for there remained alive only eleven of the whole, and on the 11th of October all, save four, were dead. Whether any white, except Lieut. Martin, survived to perish with him under the rocks at Boussa some time in November, has not been ascertained. Park himself had severe dysentery, which he considered he cured himself of with mercury pushed to salivation.

ON YELLOW FEVER IN THE WEST INDIES AND WEST COAST OF AMERICA.

By Dr. ARCHIBALD SMITH.

Read June 3rd, 1861.

DR. SMITH, in a letter, transmitting to Dr. Copland an elaborate paper on the "Spotted Hæmorrhagic Yellow Fever of the Peruvian Andes in 1854-5-6, etc.," observed that on the 15th of December, 1858, he was one of many passengers that embarked in the steamer *Valparaiso* in the bay of Panama for Callao, the seaport of Lima. On the evening of the 16th he was requested to see a sick person, whom he found in the last stage of yellow fever, with black vomit. The patient, an engineer, had only come on board the preceding day from Taboga, where he had been for some time previously ill with fever, but was supposed to be convalescent. He died on the morning of the 17th.

This case was soon followed by others. Amongst the first, were one of the deceased's coadjutors and companions, and an Italian who attended on some of the cabin passengers. Next, one of these passengers was seriously affected. Indeed many of the passengers complained, and really felt or imagined they had premonitory signs of the disease, while oppressed by the humid and sultry atmosphere between Panama and Guayaquil. No sooner, however, did they make the breezy shores of North Peru than all such uncomfortable feelings disappeared, and the morbid element or contaminated air on board was dissipated, the vessel arriving at Callao on the 25th of December in a healthy condition.

On Dr. Smith's homeward voyage from Lima in December, 1860, in the steamer *Bogota*, in conversation with Captain Wells, of that vessel, he learnt that in 1859 one-half of the men, in all thirty, then employed at the Pacific Steam Company's depôt at Taboga, died of yellow fever. It was ascertained that if the ship went alongside the wharf to coal, two or three of the men were sure to contract fever; but that if the vessels retired four hundred yards seaward from the wharf, the sick soon recovered, and none were attacked at that distance.

Captain Rivett, of the Atlantic Royal Mail steamer, the

Seine, also acquainted Dr. Smith that he has gone alongside the collier vessels at St. Thomas's with his crew in a perfect state of health and efficiency, and that, without any further communication than getting coals from a collier on each side having yellow fever patients in hammocks, he on going to sea had in a few days many ill of yellow fever, which speedily carried off nine of his crew.

After entering into a discussion, derived from information on board the steamer in which he came home, with reference to the *Icarus* at Port Royal, and already brought before the society by Dr. Bryson, Dr. Smith adverted to the yellow-fever epidemic at Guayaquil in 1842-45. He considered that the disease on the occasion in question was introduced into that equatorial city by a schooner called *La Reina Victoria*. From Dr. Destruge, of Guayaquil, an accomplished Frenchman, and one of the old medical staff of General Bolivar, Dr. Smith obtained information which he considers conclusive on this head. According to Dr. Destruge, the schooner *Reina Victoria* lay for many days at anchor in the port of Chiriqui, in the province of Veragua, where she took in for ballast wet and gravelly mud. From Chiriqui she proceeded to Panama, where she took in passengers from New Orleans and the West Indies, where yellow fever at that time prevailed. From Panama the vessel went on to Guayaquil, touching at Buonaventura. In the transit from Panama to the first seaport two of the passengers died, and were buried there. After forty-eight hours she proceeded on her voyage southward, notwithstanding she had some sick on board. Before arriving at the mouth of the river Guayaquil another death occurred, and the corpse was committed to the deep. When she reached the anchorage off the island of Puna she was reported as an infected vessel; but as the person who owned her had great influence, she was allowed to proceed and land her cargo and passengers.

The day after the schooner anchored at the lower part of the city of Guayaquil (which is built along the banks of the river), the captain, labouring under fever, was conveyed from the *Reina Victoria* to his house on shore, and was soon afterwards seized with black vomit, and died in three days, his death being ascribed by his medical attendant to melæna. In less than ten days the captain's wife, two children, and three other persons in the house, all fell victims to the fever. On the 7th of Sept. two of the crew were transferred to a house on shore, where Dr. Destruge saw them. They had been sick for six days, and the doctor observed that they had subcutaneous hæmorrhage, epistaxis, and other symptoms of yellow fever. Both died on

the following day. After these cases, the carpenters and caulkers, and other persons who had direct communication with the *Reina Victoria*, were attacked with yellow fever, and, retiring to their houses, propagated the disease in all directions. In less than twelve days more than forty persons had died of fever. The schooner was now removed up opposite to the centre of the town, and put out her ballast, and then fever broke out anew. On the 9th of October was celebrated the anniversary of the national independence. The people congregated at public diversions, and on returning to their homes were taken ill, and disseminated the disease all around. Now the victims increased rapidly, and by the end of November the deaths amounted to one hundred and thirty-five perday, in a population under 18,000. By the 8th of December the violence of the disease was abating, and the mortality decreased to about ten to fifteen per cent. of those attacked. The disease also broke out at Buonaventura, after the *Reina Victoria* left her dead there, and proved very fatal to the inhabitants of that place.

ON THE RECENT INTRODUCTION OF FEVER INTO LIVERPOOL BY THE CREW OF AN EGYPTIAN FRIGATE.

By W. H. DUNCAN, M.D., Medical Officer of Health to the Corporation of Liverpool.

Read July 1st, 1861.

THE recent introduction of fever into Liverpool by the crew of an Egyptian vessel being a matter of special interest to the members of the Epidemiological Society, the following facts regarding it are submitted for their information :—

The Egyptian steam frigate *Scheah-Gehaed* left Alexandria in the month of Nov. 1860, and after calling at Malta, arrived at Liverpool on the 16th of February. Her crew, numbering four hundred and seventy-six, consisted chiefly of Arabs, with a small proportion of the darker natives of Nubia and Abyssinia. The only European on board was the captain, a native of Austria. He had received orders to procure a supply of European clothing for the crew at Malta, but in his anxiety to make a quick passage, had omitted to do so. The weather during the lengthened voyage (thirty-two days from Malta) was cold and stormy, and the men, unaccustomed to the rigour of a northern winter, crowded below for warmth and shelter. Even those whose turn it was for duty had to be "driven" up on deck. About two hundred of the crew were convicts who were brought on board in chains, and who had never been at sea before. These suffered severely from sea-sickness, and discharged the contents of their stomach and bowels in all parts of the ship.

Under these circumstances, and considering the habits of the Orientals, it can be no matter of surprise that filth should have accumulated rapidly in the between-decks of the ship, and that the persons and clothing of the men should have become filthy in the extreme. It soon became too much even for the olfactories of the captain, who seems, however, to have made no attempt to promote ventilation, and none to enforce cleanliness beyond ordering the crew to be flogged in detachments of twenty or thirty each day.

It ought to have been stated that the space allotted to the crew below, seems to have been quite insufficient for so large a number, even under ordinary circumstances ; and when we add to the simple overcrowding the presence of an amount of filth,

personal and domestic, perhaps wholly unprecedented;* we may imagine the state of the atmosphere in the hold, and if we take into account the overfatigue consequent on the boisterous weather and the mental depression which must have prevailed, there can be no doubt that the agencies productive of disease must have been in full operation.

I have been told, but not on the same authority on which the preceding statements have been made, that the rations issued to the men were much below the proper standard as regards quantity. On the arrival of the ship at Liverpool, the crew were put upon the regular allowance of an English man of war.

All attempts to obtain authentic information as to the prevalence of sickness on board during the voyage have been fruitless, beyond ascertaining that one man died and was thrown overboard two or three days before the arrival of the ship, and that the native doctor on board stated that there had been no case of fever during the voyage.

The collector of customs, in a communication to the mayor, states that "the tide surveyor (the officer with whom rests the duty of instituting inquiries as to the state of the crew, passengers, and ship, and granting pratique) visited the vessel on the day of her arrival; that she had the yellow flag flying, a signal that she came from a port requiring the production on her arrival here of a bill of health; and that he put the usual questions to the captain, who came to the gangway, and who was able to converse in English. To one of the inquiries whether all were well on board, the captain replied that there was one man dead on board and six men ill, that their illness resulted from exposure to the cold, and that there was no contagious disease on board.

"The captain then introduced the tide surveyor to the doctor, and the latter produced a clean bill of health. There was no reason to suspect any disease of an infectious nature, the number ill being below the average for so large a crew." Had the captain's statement been correct, that only six men were ill, we must have been led to believe—looking at the condition of the ship and crew—that the laws of nature had been suspended during the voyage.

To the pilot, however, he had previously stated that the number of sick was thirty-eight, and I am informed by the

* The ship was in such a state that, immediately after the removal of the crew, it was necessary to sink her in the graving dock, and to have her repeatedly washed down and cleaned, in order to remove the filth which covered her, and polluted the surrounding atmosphere.

agents of the Pacha of Egypt that "about eighty" were on the sick-list on the arrival of the ship, suffering from dysentery and the effects of exposure to cold. That the latter number is near the truth is probable from the fact that when another medical practitioner (Mr. Irvine) was called in on the 1st of March, in consequence of the illness of the Egyptian surgeon, he found sixty-four on the sick-list, independently of those who had died or who had been previously removed to the hospital—thirty-nine in number. Of the sixty-four patients, Mr. Irvine states that six were suffering from dysentery, five from diarrhœa, two from quotidian ague, two from frost bite, and so large a number as forty-nine from constipation.

Subsequently twenty-three new cases were added to his sick list, of which five were dysentery, two bronchitis, and sixteen constipation. Mr. Irvine adds, "still no fever presented itself, nor throughout" (although he continued in attendance until the departure of the crew) "was I called upon to treat a single case which could possibly be looked upon as fever." Seven deaths occurred on board the ship from dysentery (as certified by the surgeon) between the 16th and 25th of February, *i.e.* within nine days after her arrival; and on the 25th and 27th of February, thirty-two of the sick were sent into the Southern Hospital.

With regard to these cases, Dr. Cameron, physician to the hospital, states—"Most of those who were seriously ill were suffering from dysentery or diarrhœa (about a dozen cases in all); a few from inflammatory affections of the lungs. The others were suffering from the effects of exposure to cold, which in three instances had occasioned gangrene of some portion of the foot or leg." There was no typhus, but a few presented those slight feverish symptoms so common after exposure to cold, and which passed off in a few days with little or no medical treatment. Within ten days after their admission, seventeen of the entire number were discharged, and three of the dysenteric cases had proved fatal (one in a few hours after admission). To complete the history of these thirty-two Egyptians, it may be here stated that one other death occurred (making four in all) from dysentery, followed by abscess of hand and arm, the limb having been swollen and painful on admission.

Of the entire crew—four hundred and seventy-six in number—one hundred and twenty-seven were on the sick list at one time or other during the three weeks of their stay in port. Of these, thirty-five suffered from dysentery or diarrhœa, and eleven died.

Before stating the results which followed the admission of the Egyptians into the hospital, I go on to notice the other cases which occurred on shore in apparent connection with the ship or crew. Those which arose from communication with the ship were three in number. The first victim was the pilot who brought the ship into port, and who remained on board two days and nights. On coming home his first act was to change his clothes, remarking to his wife that he had never before seen or heard of a ship or crew in such a state of filth, that the men threw the vermin from their clothes and bodies on the deck as they walked along, that there was an "awful smell" whenever he passed them, that the crew were too many for the ship, and adding "this frigate will be heard of yet." About a week afterwards he came home complaining of being unwell. His medical attendant found him passing large quantities of bloody serum, "like gruel tinged with blood," and this continued throughout his illness. In a day or two his tongue became dry and brown, his whole body covered with dark coloured petechiæ; head symptoms supervened, and he died after eleven days' illness, continually raving in his delirium about "that frigate."

The second case was that of a boy from the school-frigate *Conway*, who, with several of his companions, went on board to inspect the *Scheah Gehaed*, and in about a week after his visit was attacked with typhus, which terminated fatally in ten days. None of his companions suffered in health.

The third case was that of a chemist's assistant, who paid two visits to the *Scheah Gehaed*, and two to the *Voyageur de la Mer*, after the crew of the former vessel had been transferred to her. On his last visit he spent six hours on board, being engaged in distributing medicines to the sick, who were lying side by side on the deck. He states that they were extremely filthy, and emitted an offensive smell. It is to this visit that he himself ascribes the attack of typhus, which followed in about a week (as in the other cases), and from which, although he remained for some time in a critical state, he ultimately recovered.

It may be stated that the Austrian captain, two or three days after his arrival, had an attack of low fever of a remittent type, which confined him to his bed for a week, and which his medical attendant ascribes to the condition of the ship. The captain stated that "the filth was abominable, and the smell made him sick."

A few words will suffice respecting the cases which arose out of the visit of the Egyptians to the public baths. During

four days of the week following the arrival of the frigate, about three hundred and forty of the crew—supposed to be in good health—were sent to the baths in Paul Street in detachments of about eighty each day, in order that they might undergo a thorough cleansing. They remained about three hours in the building, those who had the first turn of the baths waiting in the hall or passages until their companions were ready to accompany them to the ship. During this time the keeper and two male attendants were in constant communication with them, preparing the baths and changing the water, etc. The matron and two female attendants were also in frequent and close approximation with them during their stay in the building. About eight or ten days after the last visit one of the male attendants, who had complained from the first, was attacked with what is described by his medical attendant as "Military Eruptive Fever," ending in "Typhus," which proved fatal in thirteen days from the first attack. Three or four days afterwards, *i.e.* about twelve days after the last visit of the Egyptians, the keeper and one of the female attendants (who had washed the bath rooms after them and complained of the offensive smell and the vermin) were taken ill of exanthematous typhus, which laid them aside for some weeks, but which did not prove fatal in either case. The matron and the two other attendants were not affected in health.

It may be stated that all of these men *walked* to the baths from the Sandon Dock, a distance of more than a mile; and all, with one exception, walked back to the ship. One of them appearing to be unwell (none could speak English) was sent back by the keeper in a car; but this man returned on foot the next day, apparently in improved health. The impression of the bath officials was that he was suffering merely from starvation, as he devoured ravenously some food which was placed before him. He was the only one of the three hundred and forty who brought a change of linen to the baths.

The Southern Hospital is a building of two stories above the basement, the front portion having no communication with the main body of the building except by folding doors on the ground floor, opening into a corridor from which four wards enter, a small ward and a larger one on either side. The corridor is open to the roof of the building, and immediately above the two large lower wards there are two similar wards opening from a gallery which runs round the corridor, one on each side. At an angle of the gallery at the back there is a children's ward, and communicating with this by a short

passage a second ward for children. In addition to these eight wards, there are in the front of the building two wards for females on the upper floor, which has no direct communication with the portion of the hospital already described. These are the only wards in which no case of fever appeared from first to last. The hospital is ventilated by a shaft which draws air from a sunken area on one side of the building into a chamber in the basement, where, after being heated by contact with metal plates, it ascends to the wards, which it enters through gratings in the floor; the foul air passing through similar gratings in the ceiling into a shaft which discharges on the roof of the building. The apparatus was believed to answer its purpose thoroughly, but it had never previously been so severely tested; the number of patients in the hospital seldom exceeding seventy, whereas after the admission of the thirty-two Egyptians it amounted to nearly one hundred in all.

In each of the smaller wards on the ground floor there were five Egyptians, and no other patients; these were the worst cases of dysentery. The remaining twenty-two cases were in the two large wards on the upper floor, nine in one ward, and thirteen in the other; each of these wards containing, in addition, other patients which brought up the total number to nineteen or twenty in each ward. The Egyptians were ranged side by side, not intermingled with the other patients. The space for each patient in the different wards varied from 730 to 790 cubic feet.

The first of the hospital staff who was attacked with fever, was the house surgeon, whose duties had been unusually arduous, and who was taken ill on the 4th of March—a week after the admission of the first batch of Egyptians.

On March 7th the nurse of one of the small wards on the ground floor was attacked, and three or four days later the nurse of the other small ward—both of these wards containing Egyptians only.

On March 11th, a fortnight after the Egyptians were admitted, a case of fever appeared in each of the large wards on the upper floor; and, in a day or two afterwards, there was an almost simultaneous outbreak in all the wards containing the ordinary patients of the hospital, with the exception of the two female wards in the front of the building. In four of the wards, it will be remembered, there were no Egyptians. In all, seventeen patients took fever (three after leaving the hospital), and of these five were in the children's wards, and twelve in the four larger wards opening from the corridor,

making about one-third of the entire number of patients in this part of the building. Of the seventeen cases, two were fatal after their removal from the hospital. Of the hospital staff and attendants, six were attacked; namely, the house surgeon, the gentleman who succeeded to the duties of house surgeon on the illness of the former, two nurses, and two porters, the last case occurring so late as March 29th; only five of the Egyptians having been left in the hospital after the 18th. Two other cases occurred in connection with the hospital, namely, a clergyman who had visited patients in the hospital on two or three occasions, and who was taken ill on March 8th, and an assistant house surgeon who was absent on leave, but who had repeatedly visited the hospital after the admission of the Egyptians. Three of these eight cases proved fatal; one of the nurses having died on the 15th, the clergyman on the 21st, and the acting house surgeon on the 24th March.

The total number of cases in connection with the *hospital*, was thus twenty-five, of which five were fatal; in connection with the *baths*, three cases, one fatal; and from communication with the *ship*, three cases, two of which were fatal; making a general total of thirty-one cases and eight deaths.

So far as I have been able to ascertain, all presented the characters of true exanthematous typhus; the fatal cases varying in duration from eight to twenty-one days, the majority about thirteen days. It may be added, that when these occurrences took place, fever was less than usually prevalent in Liverpool, the mortality having been below the average for more than twelve months previously. Among a population of 40,000 inhabitants immediately surrounding the hospital, only one death from fever had occurred during the previous six months.

The question may now be considered, how is this outbreak of fever to be explained? Three explanations suggest themselves.

1st. It may be suspected, and not unnaturally, that some of the Egyptians may themselves have been suffering from fever on their admission to the hospital. But the weight of evidence is against this supposition. The concurrent testimony of the surgeon of the ship, of Mr. Irvine, who took charge of the crew on the surgeon being incapacitated by illness, and of Dr. Cameron, under whose care they were in the hospital, is to the effect that no fever existed among them from first to last. The only medical man who saw the patients, and who is now of opinion that the disease supposed to be dysentery, was actually

typhus, is the house surgeon, who admits, however, that the idea of typhus occurred to him for the first time after the outbreak of fever in the hospital, and in consequence of it. The patients were received into the hospital by himself in the absence of the physician, and had he then had any suspicion of typhus, it would have been his duty to refuse them admission. His argument amounts pretty nearly to this, that *because* the other patients took fever, *therefore* the Egyptians must themselves have had it. This seems to be a begging of the question which can scarcely be admitted in scientific reasoning. This explanation, also, fails to account for the cases occurring at the baths, where the Egyptians, with whom the attendants were in communication, suffered neither from fever nor dysentery.

2nd. It may be supposed that the fever was generated by overcrowding in the hospital. This is certainly possible; for, although the cubic area and ventilation might be deemed sufficient for ordinary cases, yet considering the filthy state of the patients, and the nature of the cases, it must be admitted that, to some extent, the hospital was over-crowded. Theoretically, the ventilation was ample under ordinary circumstances, excepting in the two smaller wards, where it was less perfect than in the others. But the over-crowding was not to such an extent as to afford a satisfactory explanation of the outbreak, and it also fails to account for the occurrence of fever at the baths.

3rd. The explanation which seems most consistent with all the facts of the case, is that the fever poison was generated on board the ship, that it clung to the filthy persons and clothing of the crew; and that when the men were not singly, but in groups or masses, in a confined space, as in the hospital, at the baths, or on board ship, the emanations from their bodies and clothing communicated the infection to those with whom they came in contact. When admitted to the hospital, they were clothed in the same garments which they had worn during the voyage, and which appeared never to have been cleansed since their departure from Egypt. That the fever poison should have been generated on board the ship under the circumstances detailed is only what we should expect; and the only unusual circumstance in the case is, that those who generated the poison, and communicated it to others, should have themselves remained free from the disease. Two well-known facts may, perhaps, in some measure, account for this apparent anomaly. In the *first* place, the effect of habit in fortifying the system against a poison *gradually* introduced. The effluvia

between decks, at first in a state of extreme dilation, would become gradually concentrated, and the crew would thus be in the position of those who, by successively increasing doses, have become so habituated to the use of stimulants or other poisons, that they may at length take with impunity a dose which would be fatal to those unaccustomed to its use. "Upon this principle," as Dr. Watson states, "has been explained the comparative immunity from contagious diseases, of medical practitioners and nurses; of the keepers of filthy lodging houses, while the new-coming inmates suffer; and even of prisoners, who, without having had the disease themselves, may nevertheless carry forth and communicate the infection."

The *second* fact to which I have alluded is, that the darker races are comparatively little liable to continued fever, and this, no doubt, contributed to their escape from typhus, although they suffered in other ways. In slave ships, where the negroes are crowded below, often under covered hatchways, fever is said to be almost, if not altogether unknown, although other diseases make their appearance, the most frequent and fatal of which is dysentery. Dr. Copland, indeed, states generally, that the circumstances (of filth, over-crowding, etc.) which would give rise to typhus in the European, induce dysentery in the darker races; that typhus in the one race, is replaced by dysentery in the other. Dr. Cameron suggests this as an explanation of the fact, that the crew of the Egyptian frigate, although free from fever themselves, but suffering from dysentery, or saturated with the poison which produced it, communicated typhus to the whites with whom they came in contact. The doctrine that the same poison which induces one disease in the African, may give rise to a different disease in the European, is, no doubt, a novel one; but is not on that account the less worthy of consideration. Sir Gilbert Blane in his *Diseases of Seamen*, states his opinion, that even among Europeans "these two diseases (fever and dysentery) "may be considered as *vicarious*; the one substituting itself for the other according to particular accidents, and both proceeding from the same general causes." I trust that those members of the society, who may have had experience of dysentery within the tropics, where it is supposed to have a contagious character, may be enabled to throw light on a question of so much interest.

Although Dr. Cameron's suggestion, if correct, would remove the difficulty, it is not essential to the belief that the crew of the *Scheah Gehaed*, while free from fever themselves, commu-

nicated it to others. Many analogous instances are on record. There are several well authenticated cases of prisoners who had been confined in filthy, crowded, and ill-ventilated gaols, and who, themselves, remaining free from fever, communicated the disease to the judges, jurymen, and others present in the court during their trials. The best known instances are those of the Black Assize at Oxford, and the Old Bailey Session of 1750. Foderé, in the 5th volume of his *Médecine Legale*, mentions a remarkable case to the same effect, where the soldiers of the French army, during their retreat from Italy in 1799, communicated fever to the inhabitants of fifteen towns and villages where they halted on their route. The soldiers suffered from privations of every kind; they were ill-fed, their clothes in tatters, their bodies covered with filth, and exhaling a noxious smell, and their shirts, unchanged for several months, glued to their skin. "Chose aussi avérée que digne de remarque," he exclaims. This same army, which brought to Nice so destructive a scourge, was not itself attacked by it until it arrived at its destination, and when the different bodies, united together, were massed within walls and under roofs. He adds, that soldiers travelling *singly*, although charged with the infectious animal effluvium, did not communicate the disease on their route. Other instances might be cited to the same effect from Foderé, and from the older authors. Williams, also, in his *Missionary Enterprises in the South Sea Islands*, states, that a disease, which, from his description, seems to have been a contagious fever, and which carried off six hundred of the natives, was brought to the island of Raratonga by a vessel which visited them just before it commenced its ravages. He adds, "it is certainly a fact which cannot be controverted, that most of the diseases which have raged in the islands during my residence there, have been introduced by ships; and what renders this fact remarkable is, that there might be *no appearance of disease among the crew of the ship* that conveyed this destructive importation. Another fact, worthy of special notice, is that FIRST intercourse between Europeans and natives is, I think, invariably attended with the introduction of fever, dysentery, or some other disease which carries off numbers of the people."

A singular fact of a similar kind is referred to by Sir Gilbert Blane, in illustration of what he calls the "principle in the human constitution by which the presence of strangers affects it." The fact was mentioned by Dr. Cullen in his lectures, and its authenticity is vouched for by Dr. Macqueen in the first volume of *Medical Communications*. He says,

that the inhabitants of St. Kilda, one of the western islands of Scotland, distant about fifty miles from the nearest land, scarcely ever see a stranger except once a year, when the steward, with a retinue of ten or twelve boatmen, visits them to receive the rents. The inhabitants (consisting of twenty or thirty poor families) meet him on the beach and assemble round the strangers. "But behold the consequence!" says Dr. Macqueen. Within twenty-four hours almost every individual on the island is laid up with Influenza (cough, head-ache, sneezing, and coryza); and "this is so invariably the case, that it is considered as the natural and infallible consequence of the steward's visit, and the poor people are prepared accordingly."

In connection with this, it may be stated that the first victims on board the *Voyageur de la Mer* on her outward voyage to Alexandria, were two of her original crew who had been in Liverpool for two years while the ship was undergoing repairs. They were in good health when they were joined by the crew of the *Scheah Gehaed* before the sailing of the ship, but they died within five days after leaving Liverpool.

[The subsequent events in the *Voyageur de la Mer* are extremely interesting; but they have not as yet been ascertained with that degree of precision, which would justify their publication in the present number of the *Transactions* of the Epidemiological Society, further than by stating that there was a considerable amount of mortality on board (said to have been from typhus fever) during her voyage to Alexandria. J. O. McW.]

EPIDEMIOLOGICAL SOCIETY.

REPORT OF THE COUNCIL.

(*Read April 7th*, 1862.)

THE Council have the honour to submit the following brief report of the condition and prospects of the Society to the members.

Since the last Annual Meeting, four resident members and three non-resident members have been added to the Society. Three resident members have withdrawn; and the Society has to deplore the loss by death of Dr. Southwood Smith, a Vice-President; of Dr. Sayers, a member of Council; and of Dr. Cameron, an army surgeon, who had only recently joined the Society.

The following papers have been read at the ordinary meetings of the Society in the course of the last twelve months:

On Monday, April 8, 1861.—A paper "On the Climatology, Topography, and Diseases of Hong Kong, and Canton River Station", by Dr. Smart, Deputy Inspector-General of Hospitals and Fleets, R.N., was partly read by Dr. McWilliam.

On Monday, May 6, 1861.—The continuation of Dr. Smart's paper "On the Diseases of Hong Kong, etc.," was read by Dr. McWilliam.

On Monday, June 3, 1861.—The following papers were read by Dr. McWilliam, viz.; "On the Treatment of Fever in the Zambesi", by Dr. Livingstone; and "On Yellow Fever in the

West Indies, and on the West Coast of America", by Dr. A. Smith.

On Monday, July 1, 1861.—A paper "On Fever on Board the Egyptian frigate *Scheah Gehaed* at Liverpool", by Dr. Duncan of Liverpool, was read by Dr. McWilliam.*

On Monday, Nov. 4, 1861.—After the delivery of the Opening Address of the Session by the President, a "Report on Epidemics prevailing during the preceding Twelve Months" was read by Dr. McWilliam; also a paper "On an Indian Remedy for Small-Pox", by Herbert Miles, Esq., Surgeon, Royal Artillery, Halifax, Nova Scotia.

On Monday, Dec. 2, 1861.—A paper "On the Yellow (Hæmagastric) Fever of the Peruvian Andes", by Dr. Archibald Smith, formerly of Lima, was read by Dr. McWilliam.

On Monday, Feb. 3, 1862.—A paper "On the Recent Epidemic of Diphtheria" was read by J. N. Radcliffe, Esq.

On Monday, March 3, 1862.—A paper "On Such of the Diseases and Injuries of Artisans as are traceable to their Respective Occupations", by Dr. Elliot of Carlisle, was read by Dr. McWilliam.

Those of the members who have attended the ordinary meetings, will agree with the Council in considering that the papers just enumerated have been of such a character as to sustain the reputation of the Society.

The members of the Society are aware that the first number of the *Transactions* was published in November 1860, and that it was favourably reviewed in the leading medical journals of the day; and the Council have reason to believe that the second number, published in December last, has also been favourably received by the medical press and the profession.

A Committee has been formed, on the suggestion of Mr. Chadwick, "to consider the best means of investigating the question of epidemic diseases among children at schools."

A Committee has also been instituted, at the suggestion of Mr. Radcliffe, for the purpose of preparing a scheme which

* The papers by Dr. Smart, Dr. Livingtone, Dr. A. Smith, and Dr. Duncan have already been published in the Society's *Transactions*, vol. i, pt. ii.

would facilitate the more accurate observation and record of epidemic diseases in future.

The President recently again addressed the President of the Poor-law Board (enclosing a copy of the memorial transmitted to him last year) on the question of evidence being taken before the Poor-law Committee of the House of Commons, from some of the members of Council, with reference to the utilisation of the statistics of diseases among the poor, in the unions throughout the country.

A reply from the President of the Poor-law Board has been received, acknowledging the receipt of the letter and enclosure, with an assurance that the Board are aware of the importance of the subject brought to their notice by the Epidemiological Society.

Most of our members are doubtless aware of the proposition to unite in one body the medical societies in London; and that the scheme was favourably entertained by this Society. From a variety of reasons, however, the proposal has been for the present abandoned. A letter from the Secretary of the Royal Medical and Chirurgical Society, dated Nov. 29th, 1861, states that "the Council of the Royal Medical and Chirurgical Society have to acquaint you, that they are compelled to conclude that their negotiations on this subject with the other societies have failed. The expectations of a common benefit which they had entertained, and which they are still persuaded might be obtained by the contemplated union, do not appear to be shared by all the societies alike. The Council are, therefore, however unwillingly, under the necessity of requesting you to consider their proposal, at least for the present, as withdrawn."

In conclusion, the Council trust that the members of the Society will exert themselves in inducing new members to join the Society; and would fain hope that they will observe a more constant attendance at the monthly meetings.

REPORT ON EPIDEMICS, 1861-2.

By J. O. McWILLIAM, M.D., F.R.C.P., C.B., F.R.S.

(*Read November 4th*, 1861.)

No epidemic of any magnitude, happily, has to be recorded as having occurred either in this country or on the continent during the last twelve months. Cholera, which was prevailing in St. Petersburgh and other ports in the Gulf of Finland, when I last had the honour of addressing the Society on this subject, ceased with the return of spring. The same disorder disappeared about the same time at Ceuta, and other stations in the empire of Morocco.

Typhus fever raged to a considerable extent in the beleaguered fortress of Gaeta, and afterwards among the troops at Naples. This disorder was also introduced into Liverpool, in February last, by the crew of an Egyptian frigate. Typhus has also prevailed, to some extent, in several of the rural districts of England, but in a mild form.

In the north-west provinces of our Indian empire, cholera has swept over some districts with destructive force. Preceded by a desolating famine, the pestilence found among the starving population an easy prey to its ravages; and, even among the European soldiery, the per centage of deaths to attacks was unprecedentedly great.

The West Indies, more especially Havannah in the Island of Cuba, have been visited by yellow fever during the past year, with more than usual violence. Several of Her Majesty's ships have been infected at that port; and merchant ships have not only suffered from yellow fever while at the Havannah, but have lost part of their crews on their passage to Europe. The disease was actually introduced into the French port of St. Nazaire, at the mouth of the Loire, in September last.

These facts are highly important, and suggestive of the desirability of an authorised declaration of opinion by a Society like this, as to the vexed question, of the infectious or non-infectious character of this terrible malady, which has of late years, on several occasions, extended beyond its usually recognised limits, and attained elevations and latitudes long considered incapable of maintaining its existence.

With this preliminary summary and observation, I proceed to narrate, in greater detail, the chief facts which should find a place in this report.

ENGLAND.—The past year has, in this country, been somewhat remarkable for the absence of epidemics, with the exception of [illegible] fever, which has prevailed in a mild and

DR. MCWILLIAM'S Report on Epidemics relates to the year 1860-1. The date affixed (1861-2) originally referred to the Session when the Report was read. The error, likely to arise from printing the heading in the form adopted, escaped the attention of the Secretaries until it was determined to publish in the present number of the *Transactions* the Report on Epidemics in 1861-2, when Dr. McWilliam's Report had already passed through the press.

[illegible]
the national school, on the occasion of a recent [illegible] less than one-seventh part bore on their faces the marks of that loathsome disease.

The whole circumstances, indeed, of the present epidemic, which, since its commencement in 1857, has destroyed in England little short of 20,000 persons, has abundantly borne out the allegations as to the neglect and imperfection of vaccination, made by the Small-Pox and Vaccination Committee of this Society, in their Report of 1853, and Memorial of 1855. Latterly active measures have been taken by the government for the correction of this evil. Besides steps, to which reference has been made in former addresses, the sys-

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With this preliminary summary and observation, I proceed to narrate, in greater detail, the chief facts which should find a place in this report.

ENGLAND.—The past year has, in this country, been somewhat remarkable for the absence of epidemics, with the exception of typhoid fever, which has prevailed in a mild and manageable form, very extensively throughout the kingdom, more especially in many rural districts.

In many instances the disease appears to have presented some peculiar characters. More general abdominal pains than usual, and great tympanitic distension, have been observed even in cases that have ultimately done well. Diarrhœa has been rather extensively prevalent throughout the country, during the autumn; and scattered cases of what has been called "Asiatic cholera," have been seen in London, and also in some of the provincial towns. The diarrhœa was, on some occasions, characterised by a remarkably clean tongue, by the frequent presence of vomiting, and occasionally of cramps; by much abdominal pain; colic, unattended by tenderness on pressure, and by flatulency, sometimes amounting to tympanitis. The epidemic of diphtheria seems to be passing off, or at all events changing its type.

Small-Pox.—Small-pox has continued to prevail in many parts of England, and in some districts, from the previous neglect of vaccination, has proved very fatal. This has, especially, been the case in the south-western counties, in parts of Derbyshire, and in Northamptonshire. The town of Northampton may be cited as an excellent illustration of extreme neglect of vaccination, and of the results, which must always be expected, when such neglect is permitted to occur. This town, in which public vaccination has been little more than nominal, has, twice within five years, been visited by fatal epidemics of small-pox; and of the children present in the national school, on the occasion of a recent inquiry, not less than one-seventh part bore on their faces the marks of that loathsome disease.

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tematic inspection of public vaccination throughout the country has been determined on, and is now being carried out, and Boards of Guardians are empowered, by a recent Act, to enforce obedience to the Vaccination Law. Some provisions also, of the Act of 1853, which interfered seriously with its working, have been amended. The other divisions of the United Kingdom suffer yet more than England from defective vaccination laws. Neither in Scotland nor Ireland, moreover, is there any provision, such as has existed for fifty years in England, for the gratuitous supply of vaccine lymph to the medical profession. It appears to me, that this subject is well worthy the attention of our Small-Pox and Vaccination Committee.

Sanitary Reform appears to be making very satisfactory progress not only at home, but also in the colonies, and in some foreign countries, which have long been remarkable for a disregard of the laws of health.

At the recent meeting of the National Association for the promotion of Social Science, held in Dublin, several papers on subjects connected with the objects of this Society, were read in the Public Health Section, presided over by Lord Talbot de Malahide.

Dr. Richardson communicated a Paper "On the importance of a system of Registration of Diseases upon a Large Scale," pointing out how much may be done towards this most desirable end, by merely improving the form of the medical returns used by the parochial medical officers throughout the kingdom. The subject excited much interest in the section, and all the members who took part in the discussion heartily approved of the object of the author, expressing their regret that so wide and varied a field of observation as that afforded by the pauper sick in Ireland, as well as in Great Britain, should not be made available for the purposes of scientific record. It was recommended by the section, that the Council of the Association should consider what steps might be taken to press the subject on the Poor-Law Board. Whether this Society might not advantageously co-operate with the National Association, in renewing their application to Government in a matter of such great interest to epidemiological inquiries, deserves our best consideration.

The concluding part of the detailed Report of the Quarantine Committee of the Association, containing the "General Conclusions, and the Recommendations of the Report," read by Dr. Milroy, the Secretary to the Committee, was very favourably received by the section, and favourably alluded to by the

President of the Association, Lord Brougham, in his general summary of the proceedings of the meeting.

The full report, with an appendix in which is given an historical sketch of quarantine legislation and practice in this country, since its institution at the beginning of last century until the present time, was ordered by the House of Commons to be printed, and will soon be issued.

A paper on the Sickness and Mortality in the Mercantile Marine of this country was communicated by myself. This is the first occasion on which the subject of the health of our merchant seamen has been distinctly brought before the public; and although the data available for statistical inquiries, in this field, are still very incomplete, some striking results were made known which sufficed to show the importance of such an investigation in a national point of view.*

FRANCE.—The report of the "Conseil d'Hygiene Publique, etc., du Departement de la Seine," for ten years ending 1859, presented to the Society by our corresponding member, M. Trebuchet, the secretary of the Council of Health, is perhaps the most comprehensive account of all that relates to Hygiene that has as yet been published; including unhealthy occupations, baths and washhouses, water supply, food, lighting, ventilation, etc. A mere index of the principal subjects treated in this work, drawn up by Dr. Waller Lewis for the Privy Council, occupies six pages.

AUSTRALIA.—A valuable report has also been forwarded to the Society from the Central Board of Health of Victoria, Australia, by the president of the Central Board, Dr. Macrae. This report, after giving an account of an outbreak of small-pox in Melbourne from the introduction of the disease by a ship from England in 1857, and describing the means successfully employed to arrest its progress, proceeds to treat of the general sanitary condition of Melbourne and the other towns of the colony.

Measures had been taken for improving the drainage of the towns, which at present is secured by means of surface levels, conducting the drainage into the nearest or most convenient outlet. Works of some magnitude had been completed under the supervision of the Municipal Councils, for obtaining an efficient drainage, as at Portland, where a tunnel, twenty-seven

* The meeting expressed a strong opinion that Dr. McWilliam should be invited to prosecute the researches he had begun. His lamented death, unhappily for science and the public good, prevented this request being so fully carried into effect as could be wished. [G. M., and J. N. R.]

chains in length, had been driven through a sandstone hill for the purpose of draining the lower parts of the town.

The completion of the Yan Yeem Waterworks provides the city of Melbourne with an ample supply of water both for domestic and sanitary purposes, and affords great facilities for the supply of the various suburban municipalities. The board had also directed their attention to the sanitary condition of the Chinese residents in the colony, more especially of those inhabiting the neighbourhood of the "diggings" townships. All these camps were, with one exception, found in a most objectional condition in regard to cleanliness and over-crowding.

EGYPT.—A report on the sanitary state of Alexandria, by Mr. Fleming, the British delegate to the Board of Health of that port, contains some very interesting details. Mr. Fleming states that in the beginning of the present year there were such favourable accounts of the sanitary condition of Tripoli and Bengazi (which had for some time past been visited with malignant disease) that vessels coming thence were again admitted to free pratique, and a "cordon sanitaire," which had been established on the south-west frontier of Egypt, was withdrawn. The attention of the Board of Health had been much occupied with the overcrowding of the large Arab cemetery outside the city, and they had suggested a convenient and unoccupied site to the Governor of Alexandria for the purpose of making a new cemetery. As there are some mosques in Alexandria which are held in peculiar veneration, it has always been the desire of pious Mussulmans to be buried near them, and in this way intramural interments have not been uncommon; but on the urgent representation of the Board, it has been ordered by the local authorities that none but the greatest Sheikhs should be buried in these sacred spots.

The existence of several special nuisances within the town—such as rag-stores, mounds of unclean rubbish, pig yards, and the use of improper fuel in the Arab public baths without chimneys tall enough to carry off the noxious vapour produced from it,—were all brought under the notice of the Board, and after due examination, were reported by the Board to the Governor. But besides these, it was agreed that the general state of the streets, including even those of the European quarter—nay, more especially in that quarter—was for the most part disgusting, and as regards the health of the inhabitants, dangerous. In the summer, small-pox was unusually rife, particularly among the Greek and Maltese population.

Many black servants, also in European houses, were attacked with this disorder from not having been previously vaccinated.

Before slavery was abolished in Egypt, these blacks were all carefully vaccinated on the frontier. Means were recommended to the Board for making vaccination imperative in every family. At two or three villages in Upper Egypt, and one district in the lower country, the mortality had been on an unusual scale; but it was distinctly traceable to special causes, and effective means were taken to remove them.

The Moslem caravan of seven thousand pilgrims halted near Suez, on their going to and returning from Mecca, and the general health among them was unusually good. The viceroy had given orders that wards should be fitted up in the native hospitals for women and children, the prejudices of Arab women against the hospitals having of late years considerably abated. The viceroy had also given three acres of land near Cairo, to be used as a "jardin d'acclimatisation."

It has been stated that, in countries where polygamy was practised, more females than males were born; but the statistics of the past year show a preponderance of male over female births. The percentage of still-born children is much the same as in Europe; but the mortality among children is far greater. This is chiefly ascribed to the wretched and insufficient food, the want of domestic cleanliness, etc. It was communicated to the Board, as a curious and interesting fact, that the people inhabiting the shores of Lake Menjaleh, whose food almost wholly consists of fish, are remarkable for their longevity. In the last year, ten persons had reached the ages of from 100 to 110 years, and three had attained the extraordinary ages of from 110 to 130 years. Thus in Damietta, with a population of 40,000 people, the total mortality in the Arab year 1274 (July 1857 to July 1858) was 1,061 (26·5 per 1,000); of which number, 155 were from 80 to 100 years old; 22 from 100 to 110; and two from 110 to 130. In the following year, the total mortality was 823; of which number, 205 were from 80 to 100 years. In 1276 (July 1859 to July 1860), the total births in Egypt, the entire population of which in 1859 was estimated at 3,797,001, consisted of—

Males - - -	87,117
Females - - - -	76,236
Total - - -	163,353
Excess this year - - -	4,008

Deaths this year:—Males	-	71,914
Females	-	60,054
Total - -	-	131,968
Total mortality last year	-	100,750
Excess of deaths this year	-	31,218
Vaccinations:—Males	-	56,871
Females	-	57,755
Total - -	-	108,626
Vaccinated last year	-	116,571
Excess over this year	-	7,945
Treated in hospital, and in their own dwellings - -	-	61,807
Ditto last year - -	-	72,698

Giving an excess for the last over the present year of 10,811.

EMPIRE OF BRAZIL.—By recent amended regulations for the health inspection of the ports of Brazil, the sanitary service is to be performed in the manner thus prescribed. There shall be established at Rio de Janeiro, one inspector of health of the port, three assistants, one secretary, one agent, and two guards. In Bahia, Pernambuco, Maranham, Para, and San Pedro, there shall be one inspector, one secretary, and two guards. In other ports, where custom-houses exist, the inspectors of public health shall do the duty of inspectors of health of the port, assisted by two guards. The appointments of inspector and assistant-inspector can only be held by a doctor of medicine, who can speak French or English.

There shall be two forms of health visits in the port of Rio de Janeiro; the one by boat to vessels on their arrival, and the other by steamer to vessels anchored in the harbour, both visits being performed by assistants. All foreign vessels, whether men-of-war or merchantmen, shall be visited by boat. It is the duty of the assistant, who may be in the service in the steamer, to visit all vessels having, or reported as having, sick of any contagious disorder on board. Cholera morbus, yellow fever, and the plague of the East, are considered contagious diseases. Only such places in which any of these diseases exist under an epidemic form are to be considered infected. During the prevalence of a contagious epidemic of any kind, a steamer with a proper crew for the sanitary service may be established in any of the other ports of the empire.

Then follow the interrogations of vessels arriving in the

ports of the empire. They refer to the length of the voyage, the state of health of the port of departure, and on board during the voyage; as also the present condition of health, etc.

If the replies are satisfactory, and the bill of health is clean, free pratique is at once given. In case the answers are not satisfactory, the vessel will not be allowed communication until she is declared to have free pratique. No vessel shall be admitted to pratique under any of the following circumstances, viz.—

1. If she comes from an infected port, although none of the contagious diseases already mentioned have appeared on board.

2. If during the voyage any cases of such a nature have occurred.

3. If the vessel arrives with any case of the same.

If the vessel be found under the first hypothesis, the assistant will cause the letters, newspapers, etc., to be fumigated, and forwarded to their destination; all soiled linen on board to be fumigated; the bilge-water to be pumped out; and the vessel to be cleaned and whitewashed below. Having done this, she may be admitted to free pratique.

If on the second hypothesis, the vessel will be subject, in addition to what is prescribed for the first, to two or three courses of fumigation, as may be considered necessary by the assistant, who will give her pratique. Whatever may be the number of days on the voyage, the vessel will only be detained the necessary time to put the measures stated into execution (three to five days), except in cases where the malady may have ceased only two or three days previous to the arrival in the port, when the vessel will be considered in the third hypothesis. If the vessel be in the third hypothesis, wherever she may be from, and whatever may be the number of days occupied by the voyage, the following shall be observed:—

The healthy, having been as far as possible purified on board, shall be immediately conveyed to the Lazaretto, where they shall again undergo purification, and be placed under observation. If, after the fourth day, the medical officer of the Lazaretto has not met with any case of pestilential disease among those under observation, he may on the fifth, with the authority of the inspector, dispense with further means of restraint.

Should the contrary happen, but from uncontrollable circumstances it be necessary to treat the sick in the Lazaretto, the medical officer will, from the fifth day onward, renew the process of fumigating the clothes of the healthy, and permit them to have free pratique.

With regard to the vessel, she shall immediately proceed to

the anchorage; and the sick are to be conveyed to the maritime hospital, should cases of the same malady exist there. If there are no such cases in the hospital, they will be conveyed to the Lazaretto, and treated there.

In times where suspicion of epidemic sickness exists, no passenger shall land from a ship until after the sanitary visit has been made. The steamer at such times shall go the round of the anchorage daily, and receive on board sick from the ships and convey them to the maritime hospital.

In the event of epidemic disease actually prevailing, the assistant will in every case, besides ascertaining the state of health of the crew, etc., inquire carefully into the condition of the cabins, berths, and other places destined for the crew, officers, and passengers; the state of the soiled linen, of the water-tanks, and other receptacles; the state of the bilge-water, and the quality of the provisions.

Should the vessel be found defective in a sanitary point of view, or in any other of the above points, the assistant may, even in the absence of sickness on board, order the captain to remedy the evil, and refuse pratique until he has done so.

In times of sickness, the inspector, before granting a bill of health, will carefully ascertain the sanitary state of the ship.

JAMAICA.—The census of the population of Jamaica was taken in the course of last summer; the previous census having been taken in 1844.

If the enumerations on both occasions can be depended on (for there is no small difficulty in obtaining exact returns in such communities), there had been an increase of rather more than 63,000 inhabitants in the island during the last seventeen years; the population in 1844 having been 377,433, and in 1861 amounting to 441,264. It will be remembered that the loss of life, by the visitation of cholera in 1850-1, was estimated at between thirty and forty thousand souls. How much the increase of population is due to the introduction of immigrants, and how much to the natural multiplication of the resident inhabitants, has not yet been made public.

Among the population, there were 5,986 cripples; 1,294 blind persons; 1,512 persons afflicted with yaws; and 776 with leprosy; 650 deaf and dumb; and 461 insane: or, altogether, between ten and twelve thousand permanent, and to a large extent incurable invalids, out of a population of much under half a million.

The great *desideratum* in Jamaica, and other of our West Indian colonies, is a reliable registration of births and deaths from year to year. No measure could contribute more to the

moral as well as to the hygienic progress of their inhabitants: it lies at the foundation of all legislative and other endeavours to advance the real prosperity of the people.

YELLOW FEVER.

Yellow fever has continued to be prevalent during the last twelve months in various parts of the West Indies, and also along the north-east coast of South America and Brazil.

A most notable epidemic of this formidable disease occurred on the West India station in the latter end of last year, an account of which was read by Dr. Bryson, at the meeting of the Society in February last. In this instance, the propagation of the fever by infection was most conclusively established.* H.M.S. *Icarus* contracted the disease by communication with the shore at Belize, where the fever was raging. The vessel proceeded without delay to Port Royal, Jamaica; but the fever spread rapidly among the crew during the voyage.

On the *Icarus* anchoring at Port Royal, a boat was sent from the *Imaum* (the commodore's ship) to render her assistance. This boat's crew, having been attacked soon afterwards with the same form of fever, communicated it to their shipmates in the *Imaum*, where it extended with fatal rapidity.

The *Hydra* was infected in a similar manner as the *Imaum*. The disease was also introduced into the *Barracouta* by a number of young seamen, recently from England, who were sent on board from the *Imaum*, with the view of removing them out of the reach of infection. It was likewise communicated to several patients in Port Royal Hospital, who had been in that establishment for some time before the arrival of the *Icarus*.

The extension of yellow fever in these several instances, while the population in the neighbourhood, whether on shore or on shipboard, who kept aloof from the foci of infection, escaped, proves the infectious character of the disorder on grounds which cannot be reasonably disputed.

In the course of the present year (1861), there were several of those isolated epidemics of yellow fever, which every now and then fall with destructive force on our ships of war employed on the West India station, on the coast of Brazil, and, though more rarely, on the West Coast of Africa.

These visitations have not unfrequently been termed mysterious, under the belief that they arose from some undiscovered agent existing, either in the holds of the ships, or in

* See *Transactions*, vol. i, pt. ii, p. 181.

the surrounding atmosphere. Fortunately these ideas are now fast giving way to more rational views, as to the propagation of yellow fever by an infectious poison, which, in its action, resembles that by which small-pox, scarlet fever, and measles originate, and extend from one person to another.

The first vessel in which the disease appeared, was the *Firebrand*. The fever seems to have been first contracted at, or off, Carthagena; though of this there is no direct proof, and that town was at the time reported to be healthy, which means that the fever was not prevailing there in an epidemic form. The first cases occurred in the beginning of June, and although several deaths took place, the disease did not assume a malignant form. The vessel left Carthagena for Port Royal, and during the passage, the cases and the deaths became more numerous. Having sent her remaining sick into Port Royal Hospital, the *Firebrand* sailed for Halifax, Nova Scotia, when she was placed in quarantine. From this time the attacks declined in number, and the health of the crew was soon re-established.

The next vessel invaded by yellow fever, was the *Spiteful* (steam sloop 1054 tons). About the middle of July last, she went into the Havannah, where the disorder was raging both on shore and in the shipping. A fatal case having occurred a few days after her arrival in the port, she proceeded to sea; but it was too late, for the poison had already taken effect on the crew. Case followed case; for nearly three weeks the deaths were numerous, and there being no sign of the disease abating, she sailed for Halifax, where she arrived about the middle of August. Here the crew were landed, and detained in quarantine. The attacks gradually declined in number and severity; but the weather being hot and sultry, cases continued to occur occasionally up to the end of the month, and three proved fatal in a fortnight after her arrival in Nova Scotia.

Nearly coincident with the attack of the *Spiteful* by yellow fever, at Havannah, was that of the *Jason* (steam corvette, 1711 tons), by the same disease, and at the same port. The *Jason* was a good deal out at sea, and she was tolerably well aired, and for several weeks the disease appeared to make but little progress on board. About the middle of August, however, the fever began to assume an alarming character, when, but not until after many valuable lives had been lost, she also left the tropics, and ran for Halifax, which she reached early in September. The crew and all the sick were removed from the ship under quarantine restrictions, and in the course of a week the attacks had entirely ceased.

The *Racer* (steam sloop, 579 tons) was also infected at the Havannah, where she had gone for a supply of coals. The first cases occurred at sea, in the month of July, shortly after leaving that port. The disease gradually gained ground among the crew, and in the course of three weeks, became so virulent and fatal, that she also was compelled to seek relief in a colder latitude. She arrived at Halifax in the beginning of September, when the sick were landed under quarantine regulations. Two or three cases and one death occurred during the succeeding fortnight; but the further progress of the disease was speedily and effectually stayed.

It is satisfactory to know that Sir Alexander Milne, K.C.B., the commander in chief on the North America and West Indies station, who is fully aware of the infectious character of yellow fever, and duly appreciates the value of preventive measures, has issued an order to the effect that the ships of the squadron are to avoid anchoring at ports where yellow fever is known to prevail; and are not to remain more than ten days at a time in close harbours. And, moreover, that in the event of ships being invaded by this disease, they are to run to the northward for change of climate.

Some cases of yellow fever also have occurred in merchant ships, on their passage from the West Indies and Demerara to this country.

The *Dolphin*, a small vessel, with a crew of seven persons, sailed from Havannah on the 23rd July, with a cargo of Sugar. On the 29th, the mate died with black vomit, after three days illness. The vessel arrived at Guernsey on the 3rd September.

The ship *Eliza Hunter*, with a crew of twelve men, left the Havannah on the 8th of August, and arrived at Guernsey on the 24th of September. On the voyage five fatal cases of yellow fever took place. The first death occurred on the 15th August, the others followed successively on the 16th, 18th, 20th, and 24th of the same month.

The barque *Speed*, with a crew of ten men, sailed from Demerara, where yellow fever was prevailing, on the 6th of August, with a cargo of timber, and arrived at Kingstown, Dublin, on the 27th of September. Seven of the crew were attacked with the fever, of whom one died on board, and three others in the hospital at Demerara. None of these vessels were subjected to quarantine.

A most remarkable case of imported yellow fever by a ship occurred in August last, at St. Nazaire, a seaport situated at the mouth of the Loire, in France. Between the 4th and 8th August last, several fatal cases of yellow fever occurred at St. Nazaire,

Painbœuf, and Indret (the latter place being ten miles from Nantes, down the Loire), in consequence, it was said, of the arrival of the French ship *Anne Marie*, from the Havannah. The *Anne Marie*, during her passage from the Havannah, lost two seamen from yellow fever, but as both deaths occurred thirteen days before her arrival in port, the vessel was not placed in quarantine. The mate, who superintended the unloading of the cargo, died early on the morning of the 5th August, and of seven workmen from the *Gloire*, also employed in discharging the cargo, six had died on the 8th of the same month.

On the 13th, several other deaths had occurred at San Nazaire from yellow fever; but the general sanitary condition of the town was satisfactory. Stringent measures had been taken by the French authorities against all vessels arriving from Havannah and the coast of Africa. The *Anne Marie* was condemned, and scuttled at the mouth of the Loire, by order of the government inspector.

Two cases of yellow fever had occurred at l'Orient, by the 19th of August, of which one had proved fatal. The first case was that of a seaman, who belonged to a steamer plying between San Nazaire and l'Orient, and who had been on board the *Anne Marie*, at the former port. The authorities had at once established a hospital ship, with the necessary staff of medical officers, nurses, etc., at San Nazaire. It is said that eighteen persons, in all, died at San Nazaire; but of this we have no authentic account.

CHOLERA.

In my report at the opening meeting of last session, I stated that all the Spanish ports, except Valentia, were free from Cholera; and that Tangier, and the other ports of Morocco and Oran, and several other Algerine ports continued to be infected with that malady. Early in the spring all these ports were declared free of cholera, as well as St. Petersburgh, and the other ports in the Gulf of Finland.

In December 1860, cholera was reported to have broken out at Teheran, the disease having some time previously made its appearance at Yezd, whence it travelled to Kashan and Koom. The disease disappeared after some weeks; but towards the middle of June of the present year, it again broke out, and early in July had extended itself with increasing violence over the country as far as Keiseverin. His Majesty the Schah moved at first to Lur and Demanend, to escape the pestilence; but several deaths having occurred in his camp, he

proceeded to Feruzukah. Contrary to the experience of former years the disease had committed great ravages in the districts surrounding Teheran. The French and Russian missions had removed to the mountains. In the Russian camp several cases of cholera had occurred, and one had proved fatal. The disease had also manifested itself at Bagdad. In India, during the present year, cholera has followed the track of the famine which in the previous year prevailed in the north-west districts. In the absence of very precise details as to the progress and death-rate of this terrible epidemic, I can only place before you such scraps of imperfect information as I have been enabled to obtain from official records and other sources. From what I can gather as to the origin and progress of this outbreak in North-Western India, it appears, like the attacks of 1849 and 1855, to have commenced in the north-east quarter, at Cawnpoor, where it manifested itself in May, and to have made its way during the hot and rainy season to Agra, Delhi, Meerut, and Umballah, along the route of commerce. In May the disease was at Cawnpoor; on the 20th June it was at Agra and Futtyghur; on 5th July it had reached Delhi and Meerut; and by the end of July it had arrived at Umballah. About the same time the scourge visited several stations southward of Agra, as Lucknow and Benares eastward, and Gwalior westward of the river Jumna. From Umballah it soon found its way into the Punjaub, and prevailed among the European troops of the brigade at Meen Meen from the 13th to the 28th of August, when it began to abate in virulence. During this period, its greatest ravages fell on the 51st King's Own light infantry, and a wing of the 94th foot.

From the best information as yet obtained, it would appear that, among an average strength of purely British regiments, amounting to 12,000 men, something more than 800 cases of cholera had been admitted into hospital, of which upwards of 500 had proved fatal. The disease was rapidly subsiding in the Punjaub about the end of September; and the Inspector-General of Hospitals in Bengal reported, about the middle of October, that it had almost wholly disappeared in that quarter.

With reference to the course taken by cholera in the four great epidemics of that disorder which, in India, intervened between 1842 and 1860, Dr. John Murray, of H.M. Indian forces, observes:—

"In 1842, the disease spread like a wave over the country, involving station after station successively, and generally along the line of commerce. It appeared with great intensity at

Cabul, under the name of the 'Black Death', and advanced steadily in a northerly direction during the hot and rainy seasons, being invisible during the cold season. It reached Peshawur, Lahore, in 1844; Umballah, Subathoo, and Meerut in 1845; and Gwalior in 1846; and Indore in 1847. From thence it crossed the Nerbudda into the Deccan. The second attack was like a recurrent wave. It started in 1849 at Indore, and worked by way of Agra to the north-west. The third attack appeared in Bengal in 1855, extended with great severity to Benares, thence to Allahabad, and the following year to the north-west, where it disappeared. The fourth attack occurred last year, making its first appearance in Bengal, and working towards Central India. The attack this year (1861) is probably the continuation of that of last year."

It would be premature to arrive at any opinion as to the causes of the outbreak of the present year; but we understand that a general belief exists among the army medical officers, that the impurity of tanks during the rainy season, when the general ordure of the natives in cantonments is washed into the pools and reservoirs, exercises no inconsiderable influence in the production and prolongation of the disease, and urgently calls for a better system of water supply than at present exists in India, along with greater local cleanliness, and a more efficient sanitary police. We believe that these points of sanitary reform for the Indian army have been strongly advocated by some of the witnesses examined before the Commissioners on the Sanitary Condition of the Indian Army; and Government, it is to be hoped, will not be slow in adopting such measures of reform as the Commission may recommend.

The authorities in India have summoned a Commission, consisting of medical and other officers, to investigate the origin and history of the recent epidemy upon the spot.* It is said that at Candahar five thousand persons fell victims to cholera in eighteen days.

Epidemic of Typhus in the North-Western Provinces of India.†—An interesting description of an epidemic of typhus in these provinces, during 1860-61, is given by Dr. William Walker, of Her Majesty's Indian army, who observes that, till within the last few years, the idea of typhus fever occurring in India was ignored by most physicians, and (with the exception of Johnson and Martin) passed over in silence by sys-

* Mr. Strachey, civil service; Dr. Linton and Dr. McClelland, inspectors-general of hospitals; Lieut.-Col. Gauler, 73rd regiment; and Major P. Stewart, Bengal engineers.

† Edinburgh Medical Journal, No. lxxi.

tematic writers on the diseases of that country. Observation since 1856 has shown that typhus does occur within the tropics; more frequently, perhaps, in the hills than in the plains, but often enough in the plains to give it a place among the diseases of India.

As far back as June 1859, typhus fever made its appearance in an epidemic form in and around Saugor, in Central India. From Saugor as a starting point, the epidemic, keeping the main road (the line of human communication) from Central India towards the Ganges, next showed itself at Mirzapore. Passing eastward, it next appeared at Ghazeepore; and, proceeding onwards, the epidemic swept over the provinces of Behar and Benares, causing so fearful a mortality that, according to the civil surgeon of Benares, "few families altogether escaped, and for the time the population generally seemed prostrated by the extent of its inroads."

"While," says Dr. Walker, "the fever was raging in the provinces to the south and east, the cold weather supervened in the north-western districts; and the disease, although by no means extinguished, had its spread and development temporarily arrested. In almost every station situated in the tract of country lying between the Jumna and the Ganges, isolated cases were reported during the early months of the year; but it was only gathering strength for its final ravages in the warm months of spring. The civil surgeons of Mynpoory, Allghur, and Futtygur, all had occasion to remark the occurrence of one or two cases amongst the military police under their care during February and March; and each independently came to the conclusion that it was typhus with which they had to deal."

After tracing the history of this disease, and its progress from Central India eastward to the banks of the Ganges, and northwards through the country lying between the Ganges and the Jumna, Dr. Walker proceeds to describe its symptoms and characteristic features, from his own experience among the inmates of the central prison at Agra.

1862. In the April number of the *Madras Quarterly Journal of Medical Science* is a brief report of a malignant fever, probably of a typhoid character, in the Saugor district of the Madras Presidency, in the summer of 1859, by Capt. Browne, the deputy commissioner of the district. A detailed report of the disease was sent, it is stated, by Dr. Rice, the civil assistant-surgeon, to Dr. Murray.

The disease seems to have commenced in June, and to have continued till the following November. After three or four days

premonitory indisposition, the fever symptoms set in, and usually lasted for two or three days, when the patient was left in a cold sweat, and in such prostration that, unless strong stimulants were perseveringly given, the vital powers gave way, and death ensued from exhaustion. Pulmonary affections, and also copious epistaxis, were not unfrequent accompaniments. The disease seemed to be new to the people; and, as their remedies for ordinary fever had now no effect, the greatest panic prevailed. Whole families were sometimes cut off, and villages nearly depopulated. The disease was most fatal among the poorer classes, and especially those who were ill fed and housed. Although most fatal in the Saugor district, it was by no means confined to it, but seems to have been prevailing extensively about the same time in the surrounding country. The city of Saugor suffered severely, whilst the prisoners in the jail were almost free from it. Capt. Browne estimated the mortality in the district to be not less than 23,000 souls. In conclusion, he remarks that "the immediate origin of such a type of fever might very justly have been attributed to filth and crowded houses, had it been confined to towns alone; but I found it had equally ravaged the closely inhabited villages, and the small hamlets, situated in most salubrious localities."*

EPIZOOTIC DISEASES.

Last year allusion was made to the measures taken by the authorities at Warsaw, to prevent the spread of the epizootic disease known as "Steppe Murrain", from Gallicia into the adjacent districts of Poland; and by accounts from Warsaw in February last, it appears that the Polish Commission of the Interior had enforced the usual precautions in the various districts of the kingdom adjoining the government of Grodno, in consequence of the same disease, also denominated "Pestis Bovin", having made its appearance in the districts of Grodno, Bryese, Kobryn, and Kound; and that the disease had not invaded Poland. Later accounts state that the cattle (Siberian) epidemic was committing great ravages in the western provinces of Russia. In the districts Sehlu-selburg, New Ladoga, Luga, and Zarshoje, which are all within a short distance of St. Petersburg, not less than 4,400 horses, 800 cows, and 319 sheep had fallen in less than two months. The state of things in the more remote districts may be learned from the

* The symptoms of both these outbreaks of fever in India seem to indicate the *relapsing* type rather than any other.

fact, that the extensive exportation of cattle to Germany had entirely ceased.*

Numerous and severe cases of typhus amongst the inhabitants, and malignant anthrax amongst the animals, were lately observed in the villages situated on the banks of the Danube, near to its mouth. This epidemic was supposed to be caused by the putrefaction of a great many carcases of black cattle, which the waters of the Danube had carried and thrown on the banks. Bulgaria had been visited by a dreadful epidemic amongst cattle, and so many had died, that the carcases were thrown into the Danube. Great fears were at one time entertained for Galatz, and even Silistria; but the energetic measures taken by the authorities stayed the disease.

From a report by Dr. Edwin M. Snow of Providence, Rhode Island, published in the *Philadelphia Medical and Surgical Reporter*, we learn that an epizootic amongst swine has during the last five winters prevailed at Rhode Island. The disease, which has been improperly called hog cholera, has chiefly attacked large herds of the swine, and it has generally disappeared with the end of the cold weather. During the present year, however, it has prevailed more extensively, and did not, as before, cease with the approach of spring. In the course of five months, it had destroyed more than three hundred hogs in the towns of Providence, Cranston, and Johnston; and its victims elsewhere are numbered by thousands.

Dr. Snow considered the disease to be a form of typhoid fever, with diarrhœa, and occasionally with pleuro-pneumonia, arising from a depraved condition of the blood.

In the early part of the year, the cattle disease pleuro-pneumonia prevailed among the cattle in the colony of Victoria, Australia; and measures had been taken against its introduction into the adjacent colony of New South Wales.

* British Medical Journal, No. xxxix.

ON AN INDIAN REMEDY FOR SMALL-POX.

By H. CHALMERS MILES, F.S.S., L.R.C.P.E., Assistant-Surgeon, Royal Artillery.

(*Read November 4th*, 1861.)

ABSTRACT.

EARLY in the last winter a small coasting vessel landed a portion of her crew at an extreme sea-board village, a few miles from Halifax. The persons landed were sick of small-pox, and the disease soon spread, first amongst the cottagers with whom the fishermen mixed, and subsequently amongst those from the capital who resorted to the village for the purposes of trade. Through the early weeks of spring, rumour constantly asserted that vast numbers of the seafaring population were attacked with the complaint; but it was not until early in March that the large civil hospital of Halifax, by the number of its weekly admissions for variola, began to corroborate rumour, and to authenticate the justice of the public anxiety. The disease in process of time extended to the troops in the garrison; but the proportion of attacks to those among the civil population was singularly small. While certain portions of the inhabitants of Halifax were suffering from the epidemic, alarming accounts reached that place relative to the terrible ravages of the scourge amongst the Indians and coloured people generally. Variola is the special plague amongst the Indians; and when they are invaded by this pestilence it sweeps them off by scores. Like the fire of the prairies, it passes over their encamping grounds, destroying all of humankind in its path. On this occasion, the most painful details were given of whole families being carried off by this loathsome disease. After some time, however, it was said that the pestilence had been stayed. One of the Indian race, it was asserted, had come into the disease-stricken camp, possessed of a preparation which had the extraordinary power of curing the kind of cases that had hitherto proved so fatal. This remedy was believed by the Indians to be so efficacious, that, if given to them when attacked with small-pox, they looked forward with confidence to a speedy and effectual cure. An old weird Indian woman was the fortunate possessor of the remedy in question. She had always been known as the doctress of her tribe, and had enjoyed celebrity for many years in consequence of her reputed

knowledge of medicine and wonderful acquaintance with the herbs and roots of the woods. So well established was her fame amongst the Indians, that, when sick, they resorted to her rather than to the white doctors, whom they considered to be "no good". Captain Hardy, of the Royal Artillery, an able and intelligent officer, who has been for years amongst the Indians, says that "the old squaw's remedy has long been known amongst them as an infallible cure for small-pox"; and that "the Indians believe it to be successful in every case."

From the mass of details gathered in the course of conversations with the Indians, the following observations have been sifted with some care.

1. In the instance of an individual suspected to be attacked by variola, but with no distinct pock marks upon him, a large wineglassful, or gill, of the vegetable infusion (to be described hereafter) is first given. The effect of this dose is, that the eruption is at *once brought out*. After a second or third dose, given every four or six hours, the pustules subside, "apparently losing their vitality." The patient feels better after each dose, and, in the graphic expression of a Micmac, "knows there is a great change inside him at once."

2. In a subject already covered with pock marks in an *early stage*, a dose or two will "dissipate the spots", and subdue the febrile symptoms. The urine, from being scanty and high coloured, becomes pale and abundant; whilst, from the first dose, the feelings of the patient assure him that the medicine is "killing the disease." Under the influence of the medicine, in three or four days, the prominent symptoms of constitutional disturbance subside, though, as a precautionary measure, the sick person is kept in camp till the ninth day. No marks of the eruption (as regards pitting, etc.) have been left in the cases examined, in which the agent has been given.

3. With reference to the medicine acting (as believed by the Indians) in the way of preventive to those exposed to infection, it is curious to note that, in the camps where the medicine has been used, the people keep a weak infusion constantly prepared, and take a dose occasionally in the day, so as to "keep the antidote in the blood."

The medicament is the root of an unknown plant, and it is used in the following manner. A full ounce, pounded, is placed in a covered pot, and a pint and a half of spring water added to it. The contents of the pot are then slowly simmered for four or more hours, and until the quantity of liquid is reduced one-third. The infusion is then strained; and a fourth part—about a gill—is a sufficient and full dose for any

ordinary case of variola, in which the eruption has already appeared. No more than the four doses, given once or twice in the twenty-four hours, according to the relief experienced, are usually required. It may, however, as noted above, be administered every four or six hours, should this appear to be necessary. It is preferable that the infusion be given at the early stage of the eruption; but, should it be administered later, it is said that the progress of the pustules towards maturation is arrested; that the constitutional disturbance seems to abate; and that the pustules slowly commence to "dry up." In all cases, the squaw asserts, the greatest relief is experienced after the second dose.

As regards the mystic knowledge which the ancient squaw is thought to possess concerning this agent, and the jealousy, etc., with which she is supposed to guard her secret, Capt. Hardy writes:—"I believe the root to be common in the woods of this province, and perhaps in Canada; but clearly no individual, except those in the camp of the ancient squaw and her daughter, knows where to find it, or to what plant it belongs. From my long acquaintance with the Indians, I may add that I am convinced there is no deception in the matter—that the infusion of the root has done wonders for the Indians, and is looked upon by them as their greatest safeguard; in its diluted form as a preventive, and in more powerful doses as a curative agent in cases of small-pox." Instances may have occurred, however, in which the remedy was administered too late to have effect, or in which the patient was almost moribund; and of course, in such as these, the medicine could not be of avail.

To sum up more precisely the information gathered from the "antique doctress", it would seem that, when the infusion has been given, in the quantity mentioned above, to a moderately healthy subject in the first week of the disease, in no instance has there been an unfavourable result, and that permanent marks of the "pock" are not left. In such a case, the febrile symptoms have disappeared, and the favourable change has been satisfactorily established, by the third dose.

In the camp near Tangier, sixteen or more deaths had occurred prior to the receipt of the "root infusion"; and it is believed that, in all the instances in which it was administered subsequently, complete recovery followed, without marks of pitting, or any other ill effects being left by the disease.

It must be recollected that all the preceding observations have reference to the use of the "remedy" amongst the Indians alone. As regards its administration in the instance of white

people attacked with small-pox, there seems at the present time no satisfactory or reliable evidence, as to the number or nature of the cases, in which it is asserted to have been administered.

The reason why this remedy has not been satisfactorily tried in the Civic Small-pox Hospital and other places, is probably due, partly to the deficiency of information on the subject, and partly to the injudicious and unhappy manner in which the use of the medicine has been advocated.

[Subsequently to this paper being written, and after considerable difficulty, Mr. Miles obtained a specimen of the plant, from which the root was procured. It proved to be the *Sarracenia purpurea* (Nat. Ord. Sarraceniaceæ; Sex. Sys. *Polyandria Monogynia*), vulgarly called Indian cap or pitcher plant, side-saddle flower, huntsman's cap, fly-trap, trumpet-plant, or *muc-ca-kem-ma-dos—i. e.*, frog's leggings, by some Indians. A later communication on the subject, containing additional information, has been addressed by Mr. Miles to the Director General of the Army Medical Department, and was published in the *Lancet* of the 18th October, 1862. G. M.; J. N. R.]

ON THE SPOTTED-HÆMORRHAGIC YELLOW FEVER OF THE PERUVIAN ANDES, IN 1853-57.

By ARCHIBALD SMITH, M.D.

(*Read December 2nd*, 1861.)

Introduction.—On the 20th of March, 1860, I had the honour of being nominated by the Medical Society of Lima, as one of four physicians on its Epidemiological Committee. I was thus placed in a position, which led me to inquire with more care into the origin and progress of certain epidemics in Peru, and very particularly of the yellow fever, which reigned on the Andes since the latter end of 1853.

It is supposed by some medical men in that country, that the epidemics on the coast and in the mountains at this time were only coincident pestilences, without any essential similarity of nature or origin. Whether the peculiar fever which reigned on the coast in 1852-53, was of foreign or native growth, is a question which has been keenly discussed by the members of the Medical Society of Lima, but by no means satisfactorily settled.*

I believe the first case of decided yellow fever with black-vomit during the coast epidemic of 1853, occurred in a patient of my own, who died on the 16th of April. This was a lady from Arequipa. In the first consultation on this case, I stated to my colleagues, that it presented the symptoms of a true typhus-icterodes. All were agreed in looking upon it as an isolated case of this type; but we could not ascertain how it had originated, though it was true that the lady resided at the time of her illness in a great commercial house, which was the very centre of communication with Atlantic ports, and resorted to by nearly all the ship-masters in the guano trade. It was not until a month after this melancholy event, several cases more or less of a similar character, but otherwise unconnected, were brought into public notice by a zealous and active prefect—General D. Pedro Cisneros. Thus, a new light began to dawn on the minds of those physicians under whose observation some such novel cases had fallen;

* It may be deserving of notice that, from the year 1851 to 1859, Lima was subject to a succession of epidemics, ending in diphtheria and small-pox in 1858-59.

and then it was that, for the first time, the question was mooted—whether these exceptional cases were merely sporadic—and dependent on the autumnal change of season with its usual malaria, or whether they might not rather be looked upon as aggravated cases of the prevailing epidemic, then on the wane, but of which neither the yellow skin nor black vomit had been hitherto concomitant symptoms? According to the latter view of the question, the hitherto mild pyrexial disorders of 1852 and 1853, were only the primary and progressive degrees in the nascent and growing stages, of that mature yellow fever which burst forth with violence in January 1854.*

Another question much agitated in Lima has been—was the epidemic of 1852 and 1853, the offspring of infection or of contagion? By the former designation was understood the bad atmospheric condition of the locality, by the latter the mediate or immediate transmission of a morbid specific emanation from one body to another—from the sick to the healthy, in a locality not previously infected. In a limited sense, the contagious miasm of a diseased body allowed to accumulate in the sick-room, creates an infected local atmosphere; and, thus, in the English language contagion and infection are often used synonymously. On this question the arguments adduced by either party failed to convince their opponents, and the remark of La Martine (with respect to religious controversy) was applicable—"On ne prouve à l'homme que ce qu'il croit déjà." I can only say, that once the disease became general in the airy open houses of the capital of Peru, it was not easy to ascertain the precise mode of propagation, although it was certainly observed, that when the malady attacked one member of a family it generally spread throughout the household, affecting different individuals differently, according to race, or peculiar susceptibility.

Since the yellow fever pestilence of 1842-45, in Guayaquil, there had been repeated instances of persons who had had this fever on board the northern steamers, disembarking at Callao, and arriving in Lima.† But the fact, nevertheless, is a remarkable one, that it has only been since the discovery of gold in California, and the consequent rush of people and shipping

* See "Rise and Progress of Yellow Fever in Peru", Edinburgh Medical and Surgical Journal, vol. lxxxii.

† See the records of the Lima newspapers on the questions of local police, relative to yellow fever and its supposed importation from Panama, etc.—*El Comercio* of 17th April, 1852; *El Mensagero*, in its issues of 4th January, 17th March, and 18th May, 1853.

from the Atlantic to the Pacific shores, that these recent epidemics have sprung up in Peru.

Of the sanitary condition of numberless vessels that thus visited the Peruvian ports during the period referred to, it is now impossible to affirm anything with certainty. We know that early in 1852 the harbour of Rio Janeiro was crowded with shipping, and flags hoisted half-mast high as the signal of fatal yellow fever on board. How many of these vessels with their sickly crews were destined to the Pacific we have now no means of ascertaining, for every captain touching at Callao had an interest in not divulging any facts that might bring upon his ship the application of the quarantine laws. Yet, as the whole question is open to inquiry, I shall, by way of slight illustration, state one or two events in reference to it. About the middle of the year 1851, the American steamer, the *New World*, destined to California, anchored in the Bay of Callao, after having lost almost her whole crew of yellow fever in Rio Janeiro. On this subject, Lady Emeline Stuart Wortley informs her readers, that fifteen men belonging to the *New World* steam-ship died there, and the captain on his arrival in Callao, was ill from the effects of the severe attack he had had of that dreadful disorder.*

Another ship of the Pacific Steam Company, called the *Quito*, commanded by Captain Wells, entered the harbour of Callao, on the 8th of April 1852, having touched on her voyage from England at Rio Janeiro, where several of the crew caught yellow fever—a disease which had reigned there in a malignant form since early in January 1850.† The fever spread in the *Quito*, and nine men died of it before she had got to the Straits of Magellan. Among others, the commander of the steamer was attacked, and narrowly escaped by a fortunate accident. At his own suggestion he entered a bath, heated by steam. It poured into the bath so fast that it overpowered him. He fainted, and when rescued, was nearly parboiled. He was conveyed to bed. He soon recovered consciousness, and was bathed in the most profuse perspiration, which entirely carried off his fever.

One of the passengers aboard the *Quito* at this time, was a Limeñan, Don N. L., who was attacked with yellow fever, and confirmed black vomit. His case was to all appearance hopeless. But he happily survived, and when the ship made the port of Valparaiso, he was landed and left under medical

* Travels in the United States, etc., vol. iii, p. 200.

† Dr. J. O. McWilliam on the Yellow Fever Epidemy in Brazil, 1849-50.

treatment. On the 6th of May, this same gentleman arrived in Callao from Chile per steamer *Bolivia*, and on his arrival in Lima, he was often visited by one of his most intimate friends—the well known Mr. R—. This intercourse only lasted a few days, when the latter gentleman was seized with an illness, which, from the novelty and severity of its symptoms, he felt assured was the Rio Janeiro fever.*

Captain Wells, with whom I made my late homeward passage from Callao to Panama at the close of 1860, informed me in reference to the above events, that on his first arrival in the Bay of Callao with the *Quito* from England, in April 1852, he was allowed to land the passengers, and proceed, unmolested, as far as Panama. But on his return from the isthmus, he found the Peruvian functionaries at the seaport of Lima differently disposed. They expressed their intention of placing his ship—the *Quito*—in quarantine, on the express ground that in her recent passage from Europe she had been at Rio Janeiro, and came from thence an infected vessel. This purpose, however, was not carried into effect.

During the months of January and February 1854, when yellow fever raged in Lima, Madame Ida Pfeiffer visited that city and was the guest of M. Rodewald, the Hamburgh Consul. We may therefore, reasonably infer, that it was not without the most direct and reliable information received at the con-

* About this time Mr. R. was the importer of German emigrants into Lima. I was then led to believe that the cases of sickness and deaths of yellow fever, now ascertained to have been on board of the *Quito*, had occurred on board one of the emigrant ships. (Letter in *Lima Med. Gazette*, 15th July, 1859.) I thus lay under a misapprehension, which I am glad of this opportunity to dispel. We see that the source of this "Rio fever" was the *Quito*, and through this channel we have an instance of a tainted ship communication between the coasts of Brazil and Peru.

Humboldt writes (*Political Essay on New Spain*, vol. i): "The *mattazahuatl*, a disease peculiar to the Indian race, seldom appears more than once in a century. It raged in a peculiar manner in 1545, 1576, and 1706." "We have no exact data as to the *mattazahuatl*. It bears certainly some analogy to the yellow fever or black vomiting; but it never attacks white people, whether Europeans or descendants from the natives. The individuals of the race of Caucasus do not appear subject to this mortal typhus; while, on the other hand, the yellow fever or black vomiting very seldom attacks the Mexican Indians. The principal site of the *vomito prieto* is the maritime region, of which the climate is excessively warm and humid; but the *mattazahuatl* carries terror and destruction into the very interior of the country, to the central table land, and the coldest and most arid regions of the kingdom." (P. 117.)

"A very interesting problem remains to be resolved. Was the pest which is said to have desolated from time to time the Atlantic regions of the United States, before the arrival of the Europeans, and which the celebrated Rush and his followers look upon as the principle of the yellow fever, identical with the *mattazahuatl* of the Mexican Indians?" (P. 118.) See *Note A*.

sulate, that this truthful lady states in vol. ii, pp. 135-6, of her *Second Journey Round the World*, that about two years previously not less than 2000 German emigrants were induced to leave their native land at the invitation of the government of Peru. "But the ships were overcrowded, the food and water bad, they were treated like the slaves brought from Africa, and more than the half of the unfortunate creatures died on the voyage."

What kind of disease prevailed so fatally in these ships we are not now able to ascertain, though it is not improbable that while in the yellow fever latitudes, a fever produced from pythogenetic causes generated on board might have assumed the typhus-icterodes type, which at that period reigned among the shipping along the coast of Brazil. Whether, indeed, any of the German emigrant ships in question had touched at all on the Brazilian coast, has, with conflicting, and therefore, so far, neutralised evidence, been controverted recently in Peru; and official reticence casts an impenetrable veil over the fearful mortality on the passage so feelingly deplored by Madame Ida Pfeiffer. Certain it is, however, that the first of the German emigrant ships proceeding from Bremen arrived in Callao on the 9th of December, 1851, and early in January 1852, the mild adynamic or primary form of yellow fever broke out in Lima and the coast of Peru. This epidemic was vulgarly designated peste or "pelusa," just as in 1849 the same precursory form, under the name of "Polka," prevailed in Rio Janeiro—as described on the spot by Dr. Lallemant, and again quoted by Dr. McWilliam, as the first stage or stadium of yellow fever. I can state from my own observation that German emigrants were early sufferers in the Lima epidemic of 1852, which malady if not introduced by them, was at least contemporaneous with their landing in successive bands on the shores of Peru.

In July 1852, Mr. E. Gomes Sanches left Lima as envoy from the Peruvian Government to that of Brazil. On his arrival in Rio he related to some friends that a new kind of epidemic had just sprung up in Peru, and how he himself had been affected by it before his departure from Lima. Whereupon, he was told that such also had been the precursory form of yellow fever in Brazil, and that without doubt it would prove to be the same in Peru. A year after, Mr. E. Gomes Sanches returned to Lima, and soon found, as he informed me, this prediction verified to the letter. About the close of 1853, his young friend, Ensign (or Lieutenant) Don Melchor Caballero, was seized with yellow fever, and sent to the Military Hos-

pital—"San Bartolome," where he had a narrow escape of his life.

Such facts as I have thus briefly noticed, indicate, I think, a striking similarity of preliminary nature between the growth of yellow fever in nearly corresponding latitudes on both sides of the South American Continent from 1849 to 1853-4.

THE SIERRA EPIDEMIC OF 1853-57.

It is estimated that the epidemic yellow fever, which for several years in succession, committed great ravages among the Andine population of Peru, proved fatal to full one-fourth of the indigenous race. The government endeavoured to arrest its progress by sending medicines and medical men to all the inland provinces, at an expense to the treasury of thirty-five thousand dollars per month.

An order was, moreover, issued to all the prefects of the departments to send by each post a statement of the numbers of sick, and the result of the medical treatment in the different lazarettos, &c. In the department of Cuzco the mortality was excessive, and in its capital alone out of a gross population of whites, Indians and mestizoes, variously estimated before the epidemic, at from 30,000 to 40,000 souls, 12,000 deaths are said to have taken place in the course of a few months.

The nature, and separate origin of the recent Sierra yellow fevers, I mean to consider chronologically, according to the dates of their outbreak, and the course they followed in the northern, southern, and central departments.

PART I.—THE EPIDEMIC OF CONCHUCOS 1853-55.

The first in point of time, is the epidemic, which commenced in September 1853, in a mild transandine climate, and in a village of agricultural labourers, called Yurma, with a population of about one thousand inhabitants. This is usually distinguished as the epidemic of Conchucos in the department of Ancachs. In September 1854, about one year after the commencement of the disease in Yurma, the Government of Peru, then agitated by civil war, had its attention drawn to the alarming spread of the malady in Ancachs. It was resolved by the authorities to send a medical commission to the capital of that department, Huaras. On their arrival at this destination, the commission were informed by the prefect of the enormous extent of the disease, and of the mortality that attended it.

They first endeavoured to ascertain the real character of the epidemic, by daily attendance, from the middle to the end of

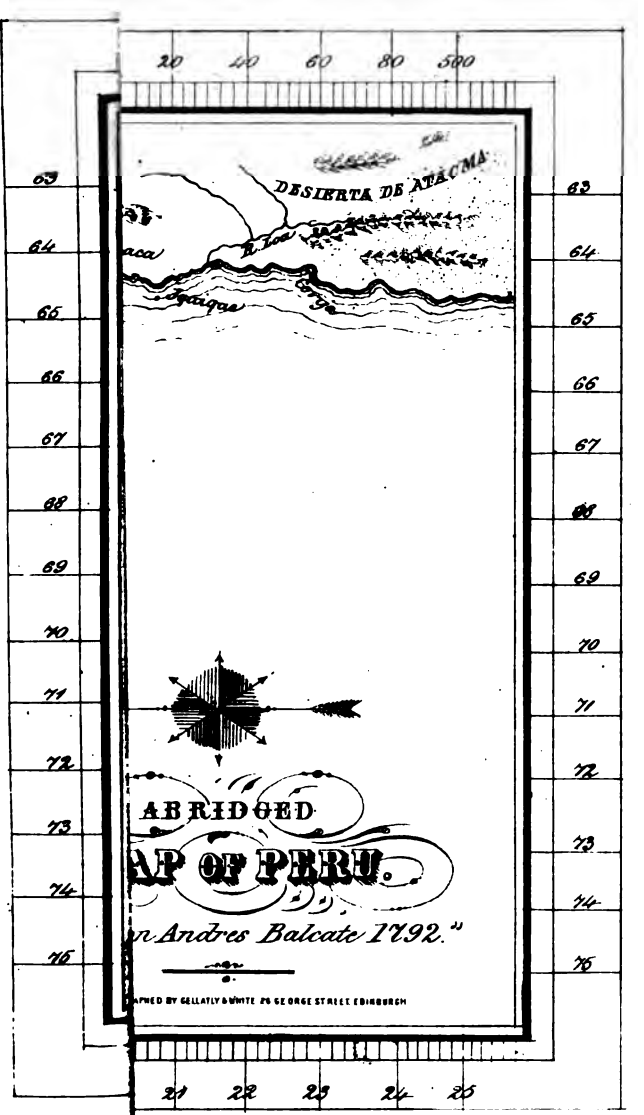
September, at the Lazaretto of Huaras; and we learn from one of the commissioners, Dr. Daza, in a manuscript memoir on the epidemic of Conchucos, addressed to the prefect of the department of Ancachs, that the commissioners (four in number) agreed to classify the disease as a "typhus or typhoid fever."

After this recognisance each proceeded to his own allotted field of observation.

In Piscobamba this physician wrote a popular treatise on the epidemic, dated 26th February, 1855, which was sent to Huaras for publication and circulation. The following account of his practical observations in that temperate climate appears to me so carefully drawn up as to deserve perfect confidence. And as a guide in the history of this epidemic he further deserves priority, on the ground that it was in the province of Conchucos that the disease first became epidemic.

Signs of the First Stage in the Epidemic of Conchucos.—"The invasion is generally sudden, and commences with a general disorder of the system, accompanied with lassitude, disinclination for food, chills and heats; headache, sometimes confined to the forehead, or embracing the whole head; slight nausea, or vomiting of a green and yellow hue; pains in the thighs and loins; on rare occasions a lax state of the bowels. All this train of symptoms appears within the first twenty-four or thirty-six hours; but it sometimes happens that the failure in strength and appetite is experienced several days before the fever is established." [I may remark, that this prefatory feeling of indisposition for some days before a decided attack of yellow fever was likewise experienced, though not very often, I believe, in the Lima epidemic of 1853. I felt it in my own case in May of that year.]—A. S.

Symptoms of the disease when fairly established in its diverse forms—1. *Of the Benignant, or simple Hœmorrhagic Form.*—"The primary symptoms of invasion having passed, the patient borne down by the fever seeks repose, and presents the following signs of disease. Prostration of vital forces, greater or less in degree according to the intensity of the fever; the countenance is singularly changed; pulse at one time broad, full, and strong, and again hard and small, but always frequent—varying from 90 to 140 beats per minute; the heat of the body, dry and ardent, is much increased; the respiration frequent and from time to time the inspirations are deep and prolonged. So great is the restlessness in some cases, that the patients cannot remain quiet, but toss about and throw off the bed-clothes continually. The headache is at



Longitud Occidental de Cadiz.

times very violent, and occasionally attended with a sense of heaviness and mental drowsiness. The eyes are loaded and watery like those of a drunken person; the lips are somewhat dry; the tongue is generally broad with a white spot in the middle, but red at its point and borders, at one time it is sharp-pointed and high coloured, at another broad, and covered with a white or yellowish tinge, and somewhat viscous. There is urgent thirst, no appetite, and the bowels are much confined. The urine is high coloured and almost red; deep-seated aching pains are strongly felt in the loins, arms and thighs, being often, however, limited to only one of these parts.

"The symptoms enumerated go on increasing until the sixth, seventh, and eighth day, and are, occasionally, prolonged to the tenth or fifteenth day—accompanied, almost constantly, from the third to the fourth day with mulberry coloured spots, which present themselves on the skin: they vary from the size of a fleabite to that of a pea, and first appear on the lower part of the breast, afterwards on the abdomen—from whence they sometimes spread all over the body. About the same period, the patient feels in the epigastrium and right flank, a pain more or less acute when pressed upon, and also a gurgling noise, under the pressure of the finger, may be observed in the latter region.* In like manner, the belly becomes enlarged in certain cases, and after a time tympanitic; but, in general, this is not the case, and the abdomen remains bland and yielding.

"During the earlier days of this fever, the patient is sleepless, or slumbers lightly, and now and then has mild delirium; but he is, at other times, observed to fall into a profound sleep, from which it is difficult to awake him.

"Lastly, on the fourth or up to the seventh day, nasal hæmorrhage very generally breaks out in profusion, and not unfrequently demands the most serious attention.

"When the fever is to end in restoration to health it is observed that, from the eighth to the fifteenth day, it declines by degrees, as indicated by the moderate heat of the body accompanied with light perspirations, less frequency and greater softness of pulse; free and easy respiration; restlessness disappearing; the headache declining into a mere sense of heaviness, with, at times, a peculiar noise in the ears; the eyes

* Dr. Macedo, in treating of the epidemic fever of Ancachs as seen by him at Huaras, says: "This noise in the iliac fossa was a very rare symptom, and may be considered as an exception." *Lima Medical Gazette.*

becoming more expressive; the tongue gradually assuming its natural appearance; thirst declining; the appetite returning; the urine, usually more abundant. And thus, after ten or fifteen days convalescence, the patient recovers his strength.

"When the fever is to terminate fatally, then the pulse becomes progressively smaller, and more frequent; the breathing hurried; the heat of the surface from being moderate becomes ardent; the head is confused, and deafness often accompanies this symptom; the lips and tongue are dry—and, at times, the latter presents open chinks covered with an exudation of blood, or a dark stain; the voice fails—speech is broken and slow; the eyes are sunk, with a fixed look; the nose is sharp; the hands and feet are tremulous and bathed in a cold sweat; the pulse is no longer perceptible, and death closes the scene.

2. *The Bilious or Icteric Form.*—This typical form presents two distinct modifications—viz., the hæmorrhagic-icteric and the non-hæmorrhagic-icteric, or congestive. In the present instance, Dr. Daza describes the latter, which he designates 'the bilious.' "From the fourth to the sixth day—up to which time the course or symptoms are just the same as in the preceding (benignant variety), this bilious form begins to show itself by a greater prostration of strength, so that the patient is unable to move himself; the pulse is small and frequent; the heat of the body is dry and burning; breathing agitated; the voice weak, and the manner of utterance much altered; the skin of the face, neck, and breast, presents a colour which varies from an opaque yellow to the brightest tint of the broom-blossom. This yellow tinge is more especially conspicuous in the white of the eye, which, as the disease advances, grows more intensely yellow. The headache is ordinarily attended with a troublesome sense of heaviness; the tongue is covered with a white or yellow coat, and in continuation it becomes dry, arid, chapped, and covered with a dark or blackish stain, the same as the lips; there is a bitter taste in the mouth; retching and vomiting of a green and yellow colour; and such is the gastric irritability that it is generally necessary to apply a sinapism to the epigastrium, in order to prevent what is drunk from being rejected by vomiting.* This form is one of the most fatal, and has caused the greatest consternation in towns and villages, where it has

* To the symptoms of this form of the epidemic, as witnessed at Huaras—on the Pacific side of the Andes—Dr. Macedo adds "hiccup" as generally present. *Restaurador de Huaras*, 11th Nov. 1854.

been confounded with the yellow fever, on account of the rapidity with which it snatches away its victims; and, also, because in some cases the yellow colour is so strongly pronounced that it stains the clothes and bed covers, even after death." [By this observation we learn, that Dr. Daza was not yet persuaded by the startling facts which he relates, to abandon the idea of 'typhus or typhoid' as conventionally agreed, before he took leave of his colleagues in Huaras.]—A. S.

3. *The Nervous or Ataxic Form.*—This variety of the epidemic, Dr. Daza informs us, is more fatal, but, happily much less frequent than the preceding. It was sometimes of only a few hours duration, and therefore required the most prompt assistance.

"*Symptoms.*—It begins with the same signs as the benignant form; but from the third to the seventh day, a series of alarming symptoms present themselves. These are a tranquil delirium, on other occasions furious raving, and almost always of an intermitting kind. Sometimes the patient falls into a profound sleep—a sort of lethargic state from which he cannot easily recover himself; the pulse is small and frequent; and, at-times, there is a species of tremor and convulsive motion in the neck and arms, or confined to the hand only. But, in fatal cases, the eyes are turned, or squint; and the patient's whole frame is seized with tremblings. The tongue is sometimes cold and pale; the headache is in most cases intolerable; appetite totally gone; thirst very little; the wasting of the body is very observable in this modification of the disease.* Should the sufferer survive the fourth or fifth day, his convalescence will be extremely protracted."

In the year 1860, Dr. Daza was returned as one of the deputies of Congress in Lima. I then took the liberty of addressing to him a note, requesting some explanation of a few points which appeared to me not quite clearly stated in his *Piscobamba Treatise on the Epidemic Fever of Conchucos*,

I particularly wished to be informed, whether he meant to say, that the skin never assumed the yellow hue in his benignant form, which he described as eminently hæmorrhagic; and if he intended to exclude hæmorrhage from the symptoms of his bilious form, as he did not mention it in his general description. In a note dated September 28, 1860, Dr. Daza obligingly replied to my inquiries, and stated that,—"In the

* Among the more rare or anomalous symptoms of the yellow fever in Cadiz, Dr. Arejula notices the sudden wasting of the body. *La Extenuacion casi Repentina del Enfermo.*

benignant form, the yellow colour of the skin was very little observable; that in the bilious form nasal hæmorrhage was of very frequent occurrence, as it also was in the other forms of the disease, though of different symptomatic value. The petechiæ he considered as common to all the modifications of the epidemic fever, and to all its stages, with this only difference, that he met with these in greater number and of larger size, in the two latter of the forms described by him, and particularly in the more advanced period of the disease."

After receipt of this satisfactory and clear statement, I had the pleasure of several personal interviews with this intelligent young physician. He informed me, among other things, that the appearance of the epidemic, in its various symptoms, was more or less modified by climate, and that he published his account of it from his experience in Vilcabamba and Pisco-bamba. But, afterwards he observed that oozing of blood from the gums was a common symptom of the epidemic in the warm district of Siguas, and that he had seen some instances where the gums and throat had sloughed or mortified. In reference to the different value to be put on nasal hæmorrhage, in the different forms of the fever, Dr. Daza remarked, verbally, that when epistaxis came on early in the case—as it often did in the more simple benignant variety, it was a favourable sign, and often critical; whereas, when it did not appear until the fourth day or later, it was a bad sign, accompanied with great prostration of vital power, and then the blood was passing rapidly to a state of dissolution.

Earliest Phases of the Epidemic in the Province of Huari. 1853-54.—Dr. George Hall, who attended the sick at Yurma, and Dr. Manuel Santa Maria who assisted in Chacas, being both dead, I applied for information to the curate of the latter place, which is a parish of 12,000 or 14,000 souls, spread over a diversified range of climate. This reverend gentleman, by name, Don Anselmo Pardo de Figueroa, kindly furnished me with the following particulars:—

1. The individual who introduced the disease into this curacy was a soldier deserter from the coast, and a native of Piscos.

2. The first who conveyed the same disorder to the town of Chacas, was Baltazar Falcon. This man caught the contagion in Piscos, where he went in search of a dead man's effects, and was carried home on a litter, the distance of six leagues. Those who came in contact with him took the fever, which soon became general in Chacas.

3. The Rev. Don Anselmo Pardo de Figueroa was himself

severely attacked by one of the forms of the epidemic with these symptoms—viz., headache, exhaustion of vital forces, pain in the bowels, a burning heat along the throat and œsophagus, vomiting, purging, and fever, almost all at one and the same time. His convalescence was exceedingly tedious.

4. At the outset of this pestilence in the year 1854, the curate, Figueroa and his two assistants, sometimes administered spiritual aid, in the way of brief confession and absolution, to as many as two hundred souls daily.

5. At the commencement in Chacas, the majority of those attacked died in three or four days; and, in certain instances, those assailed were carried off within two hours. The attack was sudden.

6. Many died with hæmorrhage, but others were observed to die, even more suddenly, who had no hæmorrhage, and whose bodies stained the ground of a yellow colour.

7. Of those who had emissions of blood from the nose or mouth, and small petechiæ, or red spots like flea-bites on the skin, many escaped. Some others whom the confessors had left as dying, while suffering under the more grave hæmorrhagic form, recovered; but of those whose bodies were covered with dark or livid spots the size of a "real," or sixpence, *not one recovered.*

8. Yellowness of the skin was a predominant symptom.

The Fever of Huari: its Origin: becomes Epidemic in Yurma and Piscos.—In Dr. Daza's memoir of 12th of September 1855, addressed to the prefect of the department of Ancachs, in which he gives the report of his professional doings and mission in Conchucos, he treats among other things of the "origin of the epidemic," the how, where, and the when of its springing into existence.

He says,—"All the current reports regarding the commencement of the epidemic of Conchucos are perfectly uniform in their details,—at least they are agreed in admitting that a *deserter* was the first who imported the disease. It is generally allowed by the principal people, that in the month of September 1853, a soldier deserter on his way back from Lima, was the first taken ill of this disease on the farm station, called Chilcabamba, in the province of Huari." "*His fever was of a kind unknown in the province. It presented the peculiarity of the whole body becoming of a high ("subida") yellow colour, and accompanied with a profuse emission of blood from the nostrils: a thing never before witnessed in those parts.*" We thus learn what was the fun-

damental type of the epidemic of Conchucos or Ancachs—it was the Hæmorrhagic-icteric.*

Dr. Daza sums up his considerations regarding the origin of the epidemic in these terms:—"What can be said with certainty is, that the inhabitants of Chilcabamba, who had bestowed their hospitality on this deserter, were shortly after attacked by the identical form of fever he had, and in so fatal a manner that the whole family succumbed."† The fever then spread rapidly in the neighbouring villages, so that according to Dr. Daza's memoir referred to, it swept off the earth, in the short period of three months, the poor people of Chilcabamba, Yurma, and Pacarrisca, sparing only about one per cent. of their inhabitants.

[It was from Yurma the epidemic passed to Llumpa and Masqui, on the way to Piscobamba. This then was the malady of which such vague reports had reached Lima in the early part of 1854, and to which I alluded at the close of my article on the Rise and Progress of Yellow Fever in Peru, which was published April 1855, in the *Edin. Med. and Surg. Journ.*, and I take this opportunity to rectify an error of date in the concluding paragraph of that paper—page 204, vol. 82: for 1844 read 1854.]

Incubation.—It is assumed that the first case of this Sierra fever was not occasioned by the heat, fatigue, and other incidents of the deserter's journey, but that he fled from Lima, already impregnated with the seeds of the disorder.

It may be said, that if this deserter had not left the Capital, the primary cause of the disease would have remained latent

* I cannot pass over this account of the origin of this epidemic without reminding my reader of the case of the soldier from Cadiz, who, in September 1804, introduced the yellow fever to the Andalusian town named De los Barrios. We are told that this Spanish soldier, of the regiment De Santiago, took lodgings in the town on the 11th, and died in the night of the 12th, or early on the morning of the 13th. The case was reported to the Junta of Health, as one likely to be contagious. A *post mortem* inspection was made eight hours after his decease. By this time, the corpse was all icteric in a high degree; and petechial, or black and livid spots disseminated, with large livid patches here and there on the body, with abundant signs of the emission of blood by the mouth. The fever now broke out in the houses nearest to the lodging of the dead soldier, and was very soon found to be a declared yellow fever. See *Observaciones Sobre la Fiebre Amarilla*, by Dr. Tadeo la Fuente. Madrid: 1805.

† This account of Dr. Daza's agrees substantially with that of Don Ambrosio Alegre of Caras, in his letter of 5th Jan. 1859, published in the *Lima Med. Gazette*. Chilcabamba is situated in a warm spot at the foot of Piscos, and about half a league from Yurma. These two latter villages stand on opposite sides of the ravine and river, that here separate the provinces of Huari and Conchucos.

in his system for several months, until revived about Christmas. That very year, 1853, the active producing cause, or constitutive element of this yellow fever lay dormant, it is assumed, in Lima and Callao, from the end of July and beginning of August to the end of December; and early in January 1854 (when the soil and atmosphere became heated with a fervid sun), the disease sprung up anew with increased energy. But, how should the delay of several intervening months be the medium of reviving a dormant cause? Will it be answered? by the awaiting of a favourable sunny season.

If solar heat be the condition required for this kind of reproduction, then, we say, that the deserter at once attained it by his flight into a warm and kindly climate. In Chilcabamba, I am informed by the curate, that the chirrimoya ripens naturally on the tree; in Lima, at the same time of year, it needs stoving to bring this luscious fruit to maturity.

The producing cause of yellow fever eludes our powers of perception. It may be a chemical compound, or a simple element capable of combination in different degrees with other kindred elements. On these topics I make no suggestions, and the reflections offered on the deserter's case, are made on the supposition that the seed of yellow fever, whatever in the abstract that may be, is capable of reproduction from one warm season to another, with the interruption of an intervening winter, just as the seeds of plants rest unproductive until the return of a fitting season.

Peculiarities of the Sierra in respect to Yellow Fever.—In Peru, the seasons on coast and mountains are antagonistic; when the weather is thick and vapoury on the sea-board, it is bright and sunny on the Andes. Between the coast and Sierra there intervenes a dry, arid, and lifeless zone of trap and granite. The difference of temperature in sun and shade, on the jagged and glacial ridges of the Cordillera is very remarkable; according as a person happens to be placed in the one or the other of these positions on the same height, he is subjected to scorching heat or chilling cold. The preponderance of solar heat all the year through on the upper Andine platforms, hardly ever permits these elevated regions to bear the wintry aspect of our European Alps for twenty hours together, because the snow that falls in the afternoon or night speedily dissolves on the following morning. The distance from one degree of temperature to another is not ruled by geographical lines, but by elevation. From the valley beneath glowing in tropical vegetation to

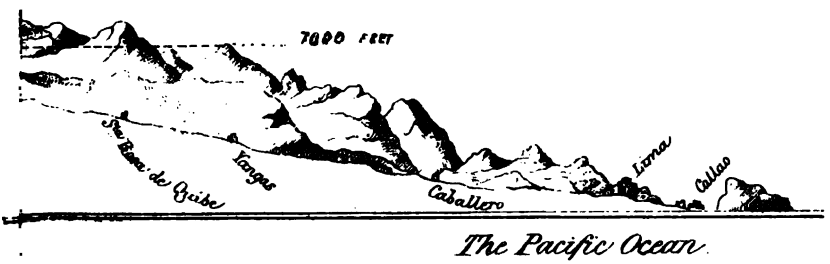
the Indian village on the cold pastoral height, that immediately overlooks the waving cane fields, or banana and orange groves, is but a bird's flight of a few minutes. The rapid transitions of the Sierra climates, naturally produced modifications more or less sthenic or asthenic in the epidemic as it moved from one village, town, or valley to another; but whatever characteristic symptom of the primary generic cause as manifested at the outbreak of the disease was lost or counteracted by circumstances in the colder, seems to have been again recovered in the warmer climate. So that, upon the whole, its vitality was never exhausted at any season. It was particularly observed in Cajamarca during the dry season, when the days are sunny, and the nights more or less frosty at high elevations, that the progress of the epidemic appeared to be arrested; but that as soon as the fall of grateful showers presaged the approach of the rainy and warmer months on the Andes, the fever acquired greater strength and facility of propagation.

Temperature needed for Yellow Fever.—It is observed by La Roche, on yellow fever—vol. i, p. 592, that a temperature of 60° Fahr. is necessary for its manifestation, and that it never prevails as an epidemic when the temperature of the summer falls below 65°. We shall find that the epidemic yellow fever of the coast of Peru (where the general annual range of temperature is from 60° to 84°*), when conveyed from Islay to the department of Cuzco, retained its vitality in particular individuals as they climbed into colder and colder regions to traverse the great western Cordillera. But in descending eastward, the fever became epidemic at Sicuani, and extended thence to the city of Cuzco, where, if I am well informed, the temperature of summer rarely if ever reaches 65° Fahr. in the shade. Again, in Cerro Pasco the epidemic still retained—we are told on respectable authority, much of its essential character during the dry months of July, August, and September, with a mean temperature of 44° by day.

Transmutation of Type as observed in Lima, &c.—M. Dupée, a respectable French artisan, had a large establishment by the River Rimac. This situation was malarial and exposed him to frequent attacks of intermittents. About the end of September 1860, when the thermometer indicated from 70° to 72° Fahr. he was seized with an intermittent

* On the sandy coast of Piura, and also of Palpa and Nasca, etc., the summer range is as high as 90°.

From an
Original Sketch
by
W Harvey, Lima,
1857.



fever. He had afterwards several returns of the ague paroxysm in all its stages for three or four successive days. On the 2nd of October, the sixth day from the first attack, blood was observed to ooze from the gums; minute petechiæ appeared on the neck and body, as well as on the lower extremities; but so small as to be scarcely perceptible. The heat of skin and frequency of pulse were, also, rapidly falling. The patient had been ill several days before he thought it necessary to apply for medical advice. When I was called to his assistance, he was suffering from an ague fit; but next day when I observed the signs enumerated of a well marked transition state, I administered a turpentine emulsion in convenient and repeated doses. On the following day I found that the warmth of the surface had been retained without the least return of fever, and that the sanguineous exudation from the gums had ceased. The patient, in the interval, passed two dark and sanguineous motions. He seemed easier, and continued so until 2 P.M., when he was surprised by an attack of epistaxis and vomiting of dark blood. The petechiæ came out freely, and some of them were the size of a silver three-penny piece *(quartillo)* on the chest, abdomen, and extremities. The surface of the body assumed a yellow colour, with ecchymosed stripes and blotches about the neck and shoulders. The case was now a declared yellow fever. I requested a consultation, and was met by Dr. D. Mariano Macedo. As to the nature of the disease there was no room for difference of opinion. We happily saved M. Dupée's life by the vigorous application of Dr. Copland's curative treatment, as laid down in his *Dict. of Pract. Med.* in the hæmorrhagic form of this dire malady.*

When we come to treat of the Sierra epidemic of 1855-56, in the valley of Abancay, we shall have another occasion to mention this subject of transition of type. Whether these transitions be admitted as modifications proceeding from the same general cause acting under special circumstances of the

* This method of cure was found so valuable, and saved so many lives in Peru, during the yellow fever reign of terror, that I shall here place on record the first case in which its application was propounded in the capital. It was the fatal case of Senor Loyo (July 1853), a gentleman from the cold elevation of Huancavilica, who had only arrived a few weeks previously from the Sierra. In its source it was supposed to have been of the nature of a remittent or intermittent fever, to which persons from the Sierra are peculiarly prone on coming to the coast in the autumnal season. But, on the first appearance of black vomit and yellow skin, etc., a medical consultation was called. It consisted, at first sitting, of six physicians. I proposed to the junta the administration of turpentine by the mouth to stop the black vomit. I was only supported by one vote. The remedy was rejected as an innovation. At a later season, its efficacy was recognised by all.

individual recipient, or as the amalgamated effects of distinct co-existent causes, are nice questions which I shall leave others to decide.

The Epidemic of the Sierra not a Disease of Race.—It has been a vain invention to call this epidemic of the Sierra a disease peculiar to the Indian race. It is very true, that on the Andine regions there are villages, towns, and entire districts of an unmixed Indian population. In such places and circumstances only Indians could be the victims; but the Rev. D. Anselmo Pardo de Figueroa, curate of Chacas, had some experimental knowledge of this subject, in his own person, though of Spanish descent. He says—"The disease was not of the Indian people, as too carelessly assumed, but rather of condition and circumstances." He explains: that under more favourable circumstances, the poor Indian might have got off as well as the better accommodated "*Dons*" of the same indigenous race, who had more means, and lived in houses instead of huts—in abodes of sufficient ventilation, and fitted with compartments, in which the sick, if necessary, could be kept apart from the sound. The fact seems to be established on the widest scale of comparison, from one end of the Republic to the other, that no rank, class, or race, were certain of not being attacked by this pestilence; while it is admitted that the poor, badly-clothed and fed, neglectful of cleanliness, and congregated with their guinea-pigs, in low, dark, unventilated hovels, without chimney or window, sleeping in their scanty clothing on sheep skins, or huddled on the floor of one confined and filthy apartment, were, by the very misery of their condition, doomed to suffer the great burden of this general calamity. I may add that the negro race, who were comparatively free from yellow fever on the coast, do not inhabit the Sierra, with some rare exceptions, on the sugar estates.

The Epidemic Contagious.—On this important subject, Dr. Daza, in his *Memoir* of the 12th September, 1855, already referred to, observes—That from Chilcabamba and Yurma, as a focus or centre, the epidemic radiated in different directions. "Not with that rapid march which characterises diseases of infection, but, on the contrary, with the slow, and up to a certain degree stationary, progress of a contagious disease; remaining in one place or town, three, four, and even six months; moving onward in a successive manner, from one station to another, without leaving an intermediate farm or hamlet free from the mortiferous visitation."

The Mortality of the Disease greatly controlled by "Hygeia."—Dr. Daza, under the heading "General Dietetic Observations," assures us that the greater number of the native Indians who perished in Conchucos during the reign of this fatal scourge, were, in reality, not carried off by the disease. He ascribes the great majority of deaths to individual circumstances, and particularly to disorders in diet in time of convalescence, during which the appetite was at once craving and insatiable. He then goes on to show the practical effects of Hygiene, and medical treatment in the well-ventilated lazarettos under his care, for the particulars of which we must turn, once more, to his memoir of 12th September, 1855, addressed to the Prefect of Ancachs.*

Lazarettos.—Dr. Daza tells us, that when he entered the district of Piscobamba, in the month of October 1854, he found the local authorities were so engrossed with political affairs that they showed entire indifference to the people. Thus, unregarded, the Indians struck by the epidemic, dropped by hundreds, and became food for the birds of prey. Under these cheerless and heart-rending circumstances he opened his first lazaretto on the agricultural estate called Vilcabamba. In this place of refuge above one hundred and eighty sick were treated during the months of November and December, and all cured, notwithstanding there were among them some cases of much gravity.

After this, in the months of January and February, and up to the middle of March 1855, we find Dr. Daza in Piscobamba, attending a lazaretto there, in which he was almost equally successful as in Vilcabamba. Out of two hundred of all ages and sexes admitted, all were cured except two.

Siguas, or Sihuas, the Capital of Conchucos.—Topography.—This provincial city is situated in a narrow glen, bounded on the north-east and south-west by lofty and almost perpendicular mountains; while towards the north-west and south-east it is open to ventilation. The locality enjoys a dry and hot climate, in which intermittent fever is not endemic. Its soil is argilaceous, and produces delicious fruit as well as plenty of corn. In this favoured place Dr. Daza opened a lazaretto, on the 15th March 1855, with eighty individuals sick of the epidemic fever. As these were gradually dismissed, completely cured, the numbers that

* For the perusal of this interesting document, I have to acknowledge my obligations to my most obliging and highly gifted colleague, Dr. Jose C. Ulloa of Lima.

afterwards entered the asylum increased progressively; so that in the three months April, May, and June, upwards of six hundred persons of all ages and sexes received medical treatment, and all recovered except eight individuals. In these fatal cases—which presented themselves in a grave state—the epidemic was complicated with other most doleful accidents, such as abortion, gangrene, consumption, and œdema of the feet, &c.

Average Duration of the Epidemic Fever in the Lazaretto of Siguas.—Taking the data furnished by Dr. Daza, of eighty persons in the latter half of the month of March, and upwards of six hundred treated in the three following months, we have a total of about seven hundred individuals of whom nearly all were cured in one hundred and seven days. If we divide the sick by the number of days, we shall arrive at the same result which, as we shall see by and bye, Dr. Don Pedro Espinosa did in his lazaretto of Ayacucho: that is, that the disease, as a general rule, was cured before the eighth day, when it ended favourably. In Huaras, however, according to Dr. Macedo, the disease was of much longer duration: probably owing to the greater cold of that locality.

Distinctive Character of the Epidemic of Huaras.—From the Restaurador of Huaras, of 11th November 1854, and from his paper on the Sierra epidemic, read before the Medical Society of Lima, 15th February 1856, we learn that Dr. D. Mariano Macedo, had no opportunity of seeing the hæmorrhagic-icteric variety of this disease. He distinguishes the hæmorrhagic form into the "simple," and more "severe," without yellow colour of the skin We have, therefore, the peculiarity, as observed by this physician, that yellow skin only accompanied the non-hæmorrhagic form, which he calls the hepatic, in Huaras.

On other points, however, Dr. Macedo's general description of this epidemic, is in accordance with Dr. Daza's. He tells us that in Huaras the fever underwent different modifications, after the close of the first stage.

Generally, from the fourth to the seventh day, when the second stage had set in, the disease assumed different forms, as the hæmorrhagic, the hepatic, and the cerebral.

The symptoms of the first stage were common to all the forms of the fever: whether the simple, more severe, or fatal.

In the second stage, therefore, there sprung up such defined differential signs as characterised the distinct forms enumerated.

Dr. Macedo remarks, that, in Huaras, the hepatic was less prevalent than the hæmorrhagic modification, but that it was the more severe and fatal. When the disease assumed this particular aspect, he observes: "The skin began to show a yellow colour, which was of a saffron hue in some, as in the most strongly marked icteric case of yellow fever." It will be observed that this corresponds to the "bilious" variety of Dr. Daza.

The Epidemic of Yurma transmitted to Caras and Yungay.—From Yurma to Huaras, Yungay, and Caras, there are distinct tracks across the breaks of the Great Western Cordillera. Two of the highest farms on the Pacific side, are Santa Cruz and Vicos, rented at the time of the pestilence by Don Ambrosio Alegre, a well-known sugar planter in Caras. To these lofty farms the fugitives from Yurma early directed their steps, but the evil which they thus hoped to escape, already circulated in their blood. The malady spread in their line of pilgrimage, and became general in the province of Huaras. Strong young people who were seen at work in the fields in apparent health, were, sometimes, so suddenly struck powerless by the epidemic poison, that in a few hours after, they were stretched out lifeless, with their bodies of an intense yellow colour; and, according to Mr. Alegre, they stained the ground yellow underneath them. This gentleman kindly favoured me with two letters, one of the 5th January 1859, and another of the 29th July 1860, on the subject of this epidemic.*

On his sugar estate Cayñasbamba, situated in an ardent climate, he established, at his private expense, a lazaretto in which there were from eighty to ninety patients at a time, from September to December 1854. It was observed by Don Ambrosio Alegre, during his constant superintendence at this lazaretto, that, generally on the third or fourth day of the fever, there appeared on the skin red or mulberry coloured spots of different dimensions: the latter, when large, being of the worst omen. The body assumed a golden

* In the first of these letters, which was published in the *Lima Medical Gazette*, it was stated that, in 1856-57, when General Vivanco's encampment was at Casma (the seaport of Huaras), cases of yellow fever and black vomit were conveyed by infected persons—"contagiados"; but that, instead of this vomit, the fatal symptoms, among those affected in the Sierra, were the dark maculæ, and red spots in the skin. It would, therefore, seem to be a fair inference from this fact, that in the climate of Caras and Yungay, to which the observation referred, at the supposed elevation of from six to seven thousand feet, the blood-poison of yellow fever, imported from Casma, directed itself chiefly to the cutaneous capillaries in preference to those of the stomach.

hue, and there were many cases attended with hemorrhage. The medical treatment in this lazaretto was limited to very few drugs, viz., tartar emetic and Epsom salts, at the commencement of the attack; iced lemonades at the height of the fever; and in the latter stages quinine. In fact, after clearing out the first passages, the treatment was principally hygienic, and out of three hundred and fifty individuals on Cayñasbamba, more than two-thirds were seized with the fever, of whom only three men and six women died. On the more distant farms, however, where he could not render early assistance, the mortality was great.

The town of Caras contained three thousand inhabitants, nearly all Indians, yet only three or four deaths occurred among them from the epidemic. But in the annexed rural district of Yañaguara, out of six thousand of both sexes and all ages, no fewer than three thousand died of this pestilence. The contrast is prodigious. Mr. Alegre, however, ascribes the difference in result to want of accommodation, cleanliness, and the general condition of life, among the rural Indians of Yañaguara. See *Note B.*

The Epidemic of Conchucos spread beyond the boundaries of Ancachs.—Leaving the fertile districts of Yungay and Caras, we now turn towards the Eastern Cordillera range, and those richly varied and fruitful regions watered by the Huallaga and its tributaries.

We have seen how this pestilence was imported from Piscos to the town of Chacas, and from Yurma to Huaras. From these points it spread southward to St. Luis, St. Marcos, Chavin, and Cajatambo. On the other hand in the village of Yanama, nearly opposite to Yurma, out of one hundred individuals attacked in 1854, only five escaped with life. Pursuing a northern course it overran the districts of Piscobamba, Siguas, and Huamachuco. In the province of Pataz it so completely destroyed the population of Chongos, that the huts were thrown in upon the dead to serve them as graves. The epidemic still pressed on its way in the direction of the Marañon. In Tayabamba it proved most fatal, and did not spare Huaylillos or the capital of Pataz, Condamarca, and Cajamarquilla: the latter being on the confines of three adjoining departments, La Libertad, Amazonas, and Cajamarca: not one of which escaped from its successive attacks. Its march was like that of the locusts, that leave one tree bare of its leaves before they fall upon the next. Chota suffered excessively, notwithstanding the efforts made in 1855 by the Prefect of Cajamarca, to prevent

the spread of contagion from Pataz.* From this latter province it slowly reached the remote city of Chachapoyas, the capital of Amazonas, in south latitue 6° 15′. In Moyobamba, the capital of Loreto, the epidemic assumed a most peculiar and fatal form. The Prefect and Bishop of Chachapoyas, in October 1857, sent officially to the supreme government in Lima, a most calamitous report of the mortality of the pestilence as developed in those parts.

Fatal Epidemic of Moyobamba.—The Bishop of Chachapoyas and his coadjutors describe the disease as having fallen heavily on the lungs, causing great disturbance of the respiratory organs, with an intolerable fetor of the breath. This latter symptom probably indicated a process of pulmonary gangrene, like some of those malignant forms with pulmonary complications, pointed out by Arejula in his autopsies. Shortly before death there was a great change observed in the colour of the skin, for the body assumed a dingy hue. This ominous sign may be looked upon as evidence of the rapidly putrescent tendency of the disease, the duration of which did not exceed three days at the most.†

The Epidemic of Conchucos transmitted through Huamalies to Huanuco.—The valley of Huanuco is a little world by itself, including almost every gradation of climate. On the east it is bounded by the E. Cordillera, whose craggy pinnacles are only frequented by the soaring condor, and on the west by the lower and central Cordillera chain, which separates it from Huamalies and the valley of the Marañon. It is watered by the upper Huallaga and many mountain rivulets. The eastern side is clothed in natural verdure towards Ambo, but at the bottom and on the western side, arid (only producing tufts of cacti) on the hill sides during eight months in the year. Here it rains little—the annual range of temperature during three years that I resided in this place did not vary 10° Fahr.; and altogether the temperature is as equable as its soil is unequalled in fertility. This valley is the great portal to the "Montaña," or wooded

* Paper entitled "Razon de las Providencias del Gobierno", or an Account of the Measures taken by the Government to Combat the Epidemic, in the Archives of the Minister of Justice, Instruction, and Beneficence, etc.

† See my contribution, entitled "Geography of Diseases in the Climates of Peru", Jan. 1858, *Edin. Phil. Journ.*, new ser., vol. vii. I may take the opportunity to notice that what is said in the article now referred to, on the German *importation* of yellow fever into Peru in its nascent form of 1851-3, is partly neutralised and further explained by the more recent information embodied in the introduction to the Sierra epidemic of 1853-7. See *Note*, p. 285.

territory of boundless vegetable riches, on the eastern side of the Andes. It is entirely free of malaria, while it is uniformly refreshed by a daily breeze following the course of the river through the break of the eastern barrier. A mountain range of 2,500 feet separates it from the valley of Chinchao, famous for its cinchona and cocoa, which is the great staple of commerce with Cerro Pasco. To the latter place from the bottom of the valley of Chinchao, on the river Huallaga, there is I think an elevation of more than ten thousand feet. Over the whole of this district the epidemic extended from the valley of Huanuco, where it first appeared in the way related in the following abridged letter from one of the principal gentlemen and landed proprietors of the district:—

"Huanuco, 12th July, 1860.

"My dear Sir,—I mean in this letter to give you some account of the yellow fever which desolated this province in the year 1855. This visitation came to us from the coast by the way of Ancachs, committing the greatest havoc in its transit among all the farms and villages. We contemplated its approach with anxiety for months, till at length it entered this province by the valley of the Igueras. The first victim of this odious pestilence in the valley of Hongoimaran, where I have my sugar estate, called Vichaycoto, two leagues to the south of the city of Huanuco, was a workman of my own, called Domingo Falcon, of the indigenous race. He caught the infection from an individual who came from Nausa and Chaulan, villages in a cold climate on the way to Huamalies. Falcon did not long survive the attack. His case was ushered in by a most violent headache and intense fever, which was attended by hæmorrhage from nose and mouth, over which ice had no power. He died twelve hours from the invasion, on Candlemas day, 2nd February, 1855, and after death his body became all over of a yellow colour. I had as a nurse in my own family—a robust young girl of twenty-four years of age, named Agueda, who was all of a sudden seized very violently. She was struck with intense headache, bodily inaction and fever, almost at one and the same moment; her skin became so hot that it felt to the touch like a heated iron. She became insensible, and raved in her mind. In less than twenty hours from the invasion she was dead, and her body became of a livid (and yellow) hue.

"The last who died in the valley was (an Englishman) Mr. John Dyer of Quicacan. The fever attacked his head, and caused delirium with insensibility. The skin and tongue

had dark stains or spots, but without hæmorrhage from the nose or mouth, which usually accompanied this petechial form in Huanuco. Mr. Dyer died on the eleventh day of the fever, and was carried off in strong convulsions.

I remain your affectionate friend,

MIGUEL YNGUNZA.

To Dr. Archibald Smith, Lima.

Don Miguel Yngunza, also furnished me with further particulars in a separate document relative to this epidemic, from which I shall make a short abstract to avoid unnecessary repetitions.

At the first outbreak of the epidemic at Vichaycoto, where he resided at the time, he had upwards of one hundred individuals on the property, of whom, as the disease progressed, he had as many as thirty, or more, in his lazaretto at a time. He himself acted the part of hospital assistant and mediciner, until towards the close of the epidemic, when he had the good fortune to secure the professional services of Dr. G. A. Mulgrew.

General features of the disease in Huanuco.*

1. Mulberry-coloured spots on the skin were almost general in the Indian, but less constant in the white race.

2. In the more severe cases, livid or black spots appeared on the tongue; blood very commonly exuded from the gums, which became swollen, and when the disorder extended to the throat, swallowing became difficult or impossible.

3. In a great majority the skin took on the yellow colour of the flower of the broom, either during life or after death.

4. Sometimes the urine was suppressed, and the bowels so much confined that they could not be relieved in the ordinary way by glysters.

5. There were cases in which those attacked by the epidemic lost their senses; became violent, and beat or tore themselves furiously. Their nails and lips used to turn blue before death, which took place in two or three days.

6. Many affected with petechiæ of a dark colour, were carried off on undeterminate days, during the first week of the malady, with profuse nasal hæmorrhage, or with vomiting of very dark blood.

Besides these special modifications of the Huanuco epidemic, Mr. Yngunza supplies the following general remarks.

While the epidemic spared no age or sex, it was always

* The city of Huanuco is by barometrical measurement, according to Rivero, 1,943 metres above the level of the sea.

observed that the young and robust were more violently assailed than the more frail and less vigorous.

The sure sign of amendment was the cessation of the headache. He that perspired freely recovered, and those who survived the tenth or eleventh day, were usually considered out of danger. But there were cases of longer duration with constant fever.

After convalescence had commenced, relapses were frequent and easily produced, especially by errors in diet; they were not few who died in this way.

N.B.—*A Curious Episode.* After the decease of Mr. Dyer of Quicacan, on 7th of September, 1855, the pestilence disappeared in the valley of Huanuco. Early in 1856, Mr. and Mrs. Yngunza made a visit to Lima, where, at this season, yellow fever reigned, especially among strangers. A favourite man servant of Mr. Yngunza's caught this fever in the capital. The man recovered after a dangerous illness, and when able to travel accompanied his master back to Huanuco—a tedious journey of seventy-four leagues. In eight days they arrived on their estate of Vichaycoto, where there had been no sickness for several months. But just four days after their arrival at home, Mr. and Mrs. Yngunza were simultaneously seized with fever, the same as they had seen in Lima, and previously in their own lazaretto. The skin in the lady's case assumed the yellow colour. In both husband and wife blood exuded from the gums, and in the gentleman's case this symptom was exceedingly severe, so as to have affected his teeth. Towards the close of the fever, which lasted eleven days, he had evacuations of blood. Convalescence was very tardy. Now, a question arises:—Was it the yellow fever of the capital or that of Huanuco revived, that attacked Mr. and Mrs. Yngunza? From them the disease was not propagated to others. The valley remained healthy.

Valley of Chinchao.—From Huanuco the epidemic penetrated to Chinchao, the adjacent "Montaña," where most of the wealthy proprietors of Huanuco cultivate the Erythroxylon coca. This is a warm and humid district, on the eastern slope of that range of mountains which shut in the bottom of the valley of Huanuco, from those regions which look to the great basin of the Amazon. Here it was expected that the disease would have assumed its most fatal character. But instead of that, it was completely disarmed of danger by the empirical treatment adopted by the Indians on the spot, as we shall notice under the head of "Treatment."

Cerro-Pasco.—This high mining town (twenty-two leagues from the city of Huanuco) is the capital of the rich and varied department of Junin, which includes Huanuco among its provinces. It is situated just under the ridge of the eastern Cordillera at an elevation of above 14,000 feet in south latitude 10° 36′. Population fluctuating, but estimated at 18,000, at the time of the epidemic. It was introduced here from the Huanuco side. It overran the districts of Yanacancha and Mataderia, chiefly inhabited by the poorer population. The centre of the town, occupied by the wealthier people, suffered comparatively little. Five or six leagues lower, towards Huanuco, by the Huacar route, we have the curacy of Chacayan, in a temperate grain growing district. In March 1855, the epidemic arrived here. It attained its height in May, and nearly disappeared by the end of August. The Rev. D. M. Saria, curate of this place, informed me of the following interesting particulars. In the lower portion of the parish of Chacayan, there is a village called Atapilca. Its population consisted before the epidemic of one hundred families, of about five or six individuals in each. They all lived in crowded, dark, and miserable huts, so, that during this horrid pestilence they were reduced to the necessity of enduring the foul air of their own bodies. Of all the wretched inmates of Atapilca not more than thirty survived the ravages of the disease. Out of five thousand parishioners, he confessed and buried one thousand three hundred. The epidemic carried off all the young and able-bodied of both sexes.

At Junin the Epidemic of Conchucos terminates.—From Cerro Pasco, the epidemic extended to Nina-Caca, whence it diverged eastward by Huancabamba to the "Montaña" of Paucartambo, on the confines of endless forests; and southward it continued its progress along the eastern side of the lake Chinchaycocha, to the village called Carguamayo. Here it seems to have come to a stand, for the town of Junin, situated in a plain by the southern extremity of this lake, we are told was not touched by it. At this point, then, I should draw the boundary line, or southern limit of the epidemic of Conchucos.

The central Andine pestilence which broke out in Chincheros, appears to have radiated northward, as far as Tarma,*

* On the Jauja route of the battalion Aymaraes, some stray cases are reported to have sprung up at Chacapalca and Apata, and may possibly have kindled the conflagration in the neighbouring districts. Dr. Espinosa ex-

and southward to the borders of the Apurimac, where it met and mingled with the great Cuzco epidemic, which commenced, as we shall explain in Sicuani.

Remark.—I have now brought my review of the different phases of the fever of Conchucos to a close. In tracing this epidemic through different regions, I have endeavoured to base all the most substantial and fundamental descriptions of the disease on precise medical evidence, and to illustrate and confirm the same, by adducing the experience of intelligent non-medical gentlemen, such as the confessor of the sick, and the founders of lazarettos—persons who had themselves direct opportunities and strong inducement to attend to the facts of which they took cognisance. All these eye-witnesses, whether medical or non-professional, testify to the same general facts, while they mutually supply each other's deficiencies in particular details, peculiar to different temperatures and localities. By this wide foundation of *data*, it is to be hoped, that partial judgments on too limited a scale of observation may be avoided, and that the reader may arrive at just conclusions from the whole evidence now laid before him. (See *Note C.*)

PART II.—THE EPIDEMIC OF AYACHUCO.

Having entered so fully into the details of the epidemic of Conchucos, I shall avoid any unnecessary repetition of similar symptoms in tracing the origin and general features of the same disease as it was observed in central and south Peru.

On the 22nd February 1855, General San Roman, then the Minister of War, issued a decree granting to all the citizen-soldiers from the southern departments permission to return to their respective homes.

The battalion Aymaraes, with destination to the inland province of the same name, in the department of Cuzco, took their homeward route through Jauja, Ayacucho and Andaguaylas. The troops left the capital in apparently a healthy state, and were about to traverse transandine districts also free of any known general disease. Lima that year (though infested with intermittents) was free of epidemic yellow fever, but it prevailed in Trujillo among the battalion Cuzco.*

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pressly states, that in no instance did the epidemic of Ancachs appear in the army of General Echenique, while in the province of Jauja in 1854. *Lima Med. Gazette*, 15th July, 1859.

* See Col. Narcisco Arestequi's letter to Dr. Garviso, in the *Resena Historica.*

Don Mariano Herencia Zeballos, Colonel of the battalion Aymaraes, took leave through the *Comercio* newspaper, of his friends in Lima, on the 24th March 1855, and on the 5th of April he entered the city of Ayacucho, at the head of about three hundred men. On this hurried march over an estimated distance of one hundred and ten or one hundred and twenty Spanish leagues, totally unaided by commissariat arrangement, there was naturally desertion and indisposition on the way. On his arrival at Ayacucho, Col. Zeballos was soon provided by the intendant, Don Tadeo Duarte, with means of transport for thirty or forty sick and weary whom he did not like to leave behind. By the evening of Easter Sunday (8th April) the soldiers of the Aymaraes with their female followers, were in march southward by Ocros, Pampas, and Bombon. They had, however, scarcely emerged from the hot mosquito territory, called the low grounds or Bajos of Bombon, when the first death of yellow fever was seen among them.

In a letter of the 20th July 1855, from Don Paulino Guillen, the governor of Chincheros, addressed to the titular physician of Ayacucho, Dr. Lucas Alejandro de Murga, we find it stated that, "the yellow fever of Chincheros originated in the case of a soldier who died in Bombon on a certain day in April; and in the month of May twenty-five licensed soldiers with six 'rabonas' (female camp-followers) succumbed to the same disease. The sick and the dead exhibit a yellow colour on the lips, teeth, nails, and all the body." In another letter to the same physician, of 23rd July, the Rev. Aniceto Jeri, acting curate of Chincheros, says, that the mortality in his parish is excessive on account of the "yellow fever," and that so many die on the hills that their numbers are incalculable. The infected corpses are viewed with horror and cannot be conveyed regularly to the parish burying ground.* From Chincheros this fatal malady spread to Cocharcas and other neighbouring towns of less note. The great fair of Cocharcas in September brought crowds of people together, and as these dispersed and returned to their homes in Cangallo, Ayacucho, and other parts, they carried with them infection and propagated the fever.

The Epidemic of Chincheros and Cocharcas transmitted

* I have taken these extracts from the authentic documents of a meeting held at Chincheros relative to "la fiebre amarilla" or yellow fever, under the sanction of the public authorities; for the perusal of which I was indebted to my obliging colleague Dr. Jose C. Ulloa.

to Ayacucho.—Dr. Pedro Espinosa was appointed to the charge of the lazaretto of Quicapata, in the immediate neighbourhood of the city Ayacucho, and has favoured me with two letters on the subject of the epidemic. One of these letters, dated the 16th April 1859, was published in the Lima *Medical Gazette*, and from the other of 29th July of the same year, now before me, I make the following extract:—"Generally, from the fifth to the sixth day, there was profuse epistaxis, accompanied with maculæ, or large blackish spots on all the trunk of the body. At this stage of the disease the headache, which had been constant and intense from the beginning of the attack, ceased. About the same time the skin assumed the yellow hue of the broom-blossom, as did, likewise, the conjunctivæ, which at the commencement were injected with blood, and in the progress of the fever took on the yellow tint in common with the skin."

Dr. Espinosa further draws the following distinction between the epidemic yellow fever as witnessed by him in the temperate climate of Ayacucho, and the ordinary tabardillo of the Sierra.

From the invasion to the close of the epidemic fever, it was attended with a languid or drowsy state of the perceptive faculties, a vacillating gait, and great prostration of vital forces. It terminated favourably by perspiration (which happily was the more usual result) or fatally by hæmorrhage: rarely, before the fifth or sixth, but, generally, before the ninth day.

In the Sierra *endemic tabardillo*, the commencement of the fever is always sthenic. The primary ardent or inflammatory period is barely concluded by the end of the first week, and then the succeeding stage with its adynamic and ataxic symptoms—[such as a small and frequent pulse, dry tongue, and fuliginous teeth, arid skin and petechiæ, delirium, &c.]—does not terminate before the fourteenth, or, it may be, the twenty-first day. In the tabardillo, hæmorrhagic attacks are not frequent, and when epistaxis occurs it is for the most part of good omen, or critical. The petechiæ (not unfrequent) in the tabardillo are very small, and of a higher colour than in the epidemic fever—besides, they do not appear before the end of the first week. In the epidemic convalescence was very slow; but in the endemic it is more easy and rapid, and less liable to relapses. Tabardillo is not essentially contagious, whereas the epidemic was eminently contagious.

To prevent overcrowding, and guard against relapses, Dr.

Espinosa had a separate sanitarium for convalescents at the distance of a quarter of a league from the lazaretto of Quicapata. To this provision he ascribed much of his success in the cure of the epidemic. (See *Note D.*)

The Epidemic of Chincheros extends to Abancay.—In the valley Abancay, and at the distance of three leagues from the provincial capital of this name, is situated the extensive estate called Auquibamba, lately rented by (or the property of) Dr. Teodoro Ureta, who resided upon it when the epidemic of 1855-56 reigned there.* This gentleman, by profession a physician, but independent of medical practice, favoured me with the following information.

The boundaries of Auquibamba, stretch from the river Pachachaca to the cold and lofty pasture lands, and consequently the estate partakes of great diversity of atmospheric temperature. On the low grounds the summer heat indicated by the thermometer of Reaumur is 24° and the winter temperature 17°.

The sugar plantations are subject to malaria, and during the epidemic of 1855-56 many cases of this disease terminated in the remittent or intermittent form, when they readily yielded to the free use of wine and bark. Other cases were observed during the same period, which began as intermittents and ended in the continued epidemic form.

The constant and unfailing symptom of the epidemic was pain in the head and eyeballs, which latter were red and injected at the commencement, when the patient could not look up without great uneasiness in the orbits. The skin became yellow, as did also the white of the eye, in course of the fever. Very many had epistaxis, others had maculæ or petechiæ, and vomiting or evacuations of blood. In protracted cases new complications arose, and when vital action was at a low ebb, sores like issues opened on the skin.

Dr. Ureta was peculiarly struck by the pathological physiognomy of the sick. Almost all of them had a remarkably dull heavy look, some with pale and others with flushed countenances; some in a state of perfectly helpless prostration, and others with high fever and pulse—one requiring cordials of wine, camphor, &c., while others, especially on the colder heights, actually needed the lancet.

The Rev. Dr. D. Angel Cardinas, of the large Indian

* Close to Auquibamba, the remains of the battalion Aymaraes, thinned by disease and desertion, turned off the Cuzco line of road to their own province.

town Huancarama, escaped from a severe cerebral and congestive form of this fatal pestilence, by the aid of cupping and blistering. Out of two hundred attacked on his own property, Dr Ureta, in spite of his best efforts to save all, lost thirty individuals. He found that when early assisted by a simple emetic or purgative, the mortality was greatly diminished. In conclusion, Dr. Teodoro Ureta, in a memorandum of 9th April 1860, addressed to me on the subject, sums up the character of the epidemic of Abancay in the following terms:—"The most prominent symptoms were headache and pain in the eyes; excessive heat and thirst; a yellow colour of the whole body; nasal hæmorrhage, and a total prostration of strength."

PART III.—ON THE YELLOW FEVER IN CUZCO.

In the *Comercio* newspaper, of 25th April 1855, we peruse a communication from Islay, of date 21st April, intimating that the town was being deserted:—"To escape from the yellow fever the terrified inhabitants have emigrated to Arequipa, Tacna, Vitor, or Camana, &c." (See *Note E.*) The writer goes on to give a thrilling description of the fatal forms of the malady;—in some it was signalized by bilious vomiting at the invasion, but soon ending in blood, and proving fatal within twelve hours:—others again, succumbed under evacuations—first of coagulated, but ultimately of "living" blood—within three days, as did also those attacked in the "lethargic" form. The writer then asks, What are we to do? and answers, "*Esperar la muerte,*" wait for death. Such then was the condition of the sea-port of Islay, just before the arrival of the battalion Cuzco, which left the capital on the 15th May. The colonel of this division of licensed troops was D. Narcisco Arestequi, who in a letter of 5th July 1856, addressed to the medical commissioner Dr. C. Garviso in Cuzco, and published in the *Resena Historica*, of the epidemic by the latter, informs us —That many soldiers of the battalion Cuzco during twenty-four hours stay in Islay became indisposed, and when they had got to the city of Arequipa (about thirty leagues inland) no fewer than fifty-four of them were sent to hospital, of whom three serjeants died only a few hours after admission. This unfortunate event carried immediate panic into the hearts of the soldiery, so that, as the colonel says, not a few of the men were seized with intermittent fever and dysentery, for the cure of which he wished them to go to hospital, but instead of doing so, they betook themselves, all scared, to

the mountains—following the road of Cuevillos to Lampa. The colonel remarks, "It was impossible to avoid our leaving behind at every resting place on the journey some absolutely grave cases, of whom, as well as of those left in the hospital of Arequipa, few have reached Cuzco."*

Dr. Tejada was the first medical commissioner sent by order of the Prefect of Cuzco to examine and report upon the nature of the fever which had broken out among the licensed soldiers of the battalion Cuzco at Sicuani—twenty-five leagues from the old capital of the Incas—where it first became epidemic in July 1855. In a letter from Dr. Tejada, of date 12th July 1856, addressed to Dr: Garviso, and published in the *Resena Historica,* of the Cuzco epidemic, we have the following statement:—"The epidemic which reigned in Cuzco and in different provinces of the department, was constantly characterised by such symptoms as leave no doubt of its being the true yellow fever under different forms; as from its first appearance in this capital, I officially intimated to the prefectoral authority on the 6th day of October 1855. In the deep and hot valleys it always carried the characteristic seal of the yellow fever—the typhus-icterodes or black vomit of authors,—while in the colder and elevated regions it assumed the character of typhus in its various modifications."† Dr. Bernardo Pacheco, as quoted by Dr. Garviso, arrived at the same conclusion as Dr. Tejada, with respect to climatic modifications of type observed by him in the adjoining department of Puno during the reign of the epidemic. The department of Cuzco is the most

* It is curious to contrast the fate of the battalion Cuzco, landed at Islay, with that of the portion of the battalion "Arequipenos Libres" which escaped shipwreck in the steamer *Rimac,* off the point of Lomas, on the 1st March, 1855. Of these troops, two hundred got safely on shore near Acari, and marched thence to Arequipa, about three hundred miles of desert, animated by the spirited example of endurance given by the daughter of their general, Albuzuri, without a single case of yellow fever. One chaplain and two or three men, overcome with fatigue, are said to have been the only victims of this march. Col. Narcisco Arestiqui ascribes much of the sickness in the battalion Cuzco to the fatigues of the comparatively short desert march from Islay to Arequipa, and supposes terciana and dysentery to have sprung from fear of the pestilence which carried off so suddenly their three sergeants. But a better reason for the appearance of ague among their ranks would be that many of them travelled to Arequipa from the sea-port by the malarial valley of Vitor; and, as for dysentery, it is the usual lot of strangers who drink of the crude water of Arequipa—though safe for culinary purposes—as shewn satisfactorily by Dr. Juan Gualberto Valdivia, in a discourse read at Arequipa on the 30th April, 1845, and published in his *Miselanea Chimica.*

† At the cold and lofty station Huancavelica, Dr. Villar describes the epidemic diseases of 1855-6 as in a great degree *masked* under the ordinary symptoms of typhus. *Lima Med. Gazette.*

densely peopled in Peru, and on that account it suffered more than any other in this epidemic.

The city of Cuzco is situated at the elevation of 3,468 metres, according to Don M. E. de Rivero, in a transandine country, and lat. 13° 30′ south. And yet at this elevation, where the summer temperature in the shade is stated to be 12° or 13° of Reaumur, and the winter temperature from 7 to 8° of the same, yellow fever as described by the medical commissioners and others, raged with unmitigated virulence during the wet season (which is the summer) 1855-56. I have examined the statistical table of cases cured by Dr. C. Garviso in Cuzco, which is attested by D. Damasco Lechaga, the commissary of police, and find that out of one hundred and thirty cases reported in abstract, seventy-seven were of white race; twelve Mestizoes, and forty-one pure Indians. This enumeration shows that the yellow fever of Cuzco was not exclusively of a particular race. Dr. Garviso in his statistics mentions different modifications of the epidemic fever, under such headings as the icteroid, cyanose, bilious, petechial, adynamic-petechial, ataxic, and hæmorrhagic, &c.; under the denomination petechial-adynamic he relates the case of J. Vergara de Manca, of white race, seventy-five years of age, and of a weakly constitution, he says, "This woman was attacked at three o'clock in the morning, and instantly her body was covered all over with numerous black spots, the skin being of a yellow colour, and the prostration extreme. She had vomitings and cold sweats, with almost a glacial coldness of the body generally." This patient, we are told, was cured on the fifth day, by the help of ammonia and cinnamon, quinine, camphor, and opium. Another case—Rosa Rolanda, of white race, and thirty-five years of age, presented as symptoms, "Vomitings and evacuations of a bilious dark green appearance; the skin of an intense yellow with all the other signs and characteristics of yellow fever of the highest grade." Again, Josefa N——, an Indian or Chola, by race, is represented as having, "blackish-green bilious and sanguineous vomiting and purging with the yellow colour of the skin." Among the hæmorrhagic cases are enumerated a great variety such as, "nasorrhagias, gastrorrhagias, enterorragias, and abundant pneumorrhagias."

I cannot here occupy more space, or weary the reader's attention by a full description of all the horrors of the Cuzco epidemic of the wet season of 1855-56. By the church doors and open streets death suddenly seized its victims. The public hospitals and conventual asylums for females,

were crowded to excess from November to May, with cases in every stage of progress. The newly attacked, the more aggravated, the dying, and the dead, were all seen huddled together. In January 1856, a very intelligent officer, Don Miguel Criado, who was one of the first attacked with yellow fever and black vomit in Lima (on the 14th May 1853), accompanied to Cuzco in capacity of Secretary, the new Prefect General, Buen Dia. The prefect was almost immediately on his arrival laid up with the fever, so that during his illness the daily duty of inspecting the different hospitals of the city fell on his secretary, who described that the pestiferous stench on entering these receptacles of human woe was overpowering—the air of the wards was saturated with animal miasms! He observed to me that the disease was the same in Cuzco as in Lima. Of two hundred convicts employed in Cuzco, in burying the dead, only two men escaped with their lives. (See *Note F.*)

Addendum.—At the port of Arica the licensed battalion Tacna, on its return to the capital and province of the same name, were disembarked on the 8th of April 1855, direct from Lima, and apparently well. They entered the town of Tacna on the 12th of the same month. They had barely taken up quarters when yellow fever broke out among them, in the suburban section called the Rancheria. They were supposed to have caught infection in Arica, where there had been previous to their arrival some cases of yellow fever. The fresh ingress of troops, therefore, supplied material for the epidemic.

Treatment of the Sierra Epidemic Yellow Fever.—We have filled our space and have no room left for a detailed account of medical treatment.

The Indians of Conchucos following a natural instinct, had a great craving for the "chulco," or wild cress, which they devoured with eagerness. In the fruit-growing valleys lime juice and iced lemonades were in liberal use.

In the valley of Chinchao, where it was feared that the fever would prove most fatal, matters turned out quite contrary to expectation. The malady was at once disarmed of its terrors, and arrested completely in its course by covering up the individual attacked with the fresh green and fragrant leaves of the indigenous erythroxylon coca. This novel appropriation of the staple production of the valley excited the most profuse perspiration, which ended in immediate recovery—the remedy was infallible. We can imagine how powerfully these leaves, full of empyreumatic qualities,

would affect the nervous susceptibility of the sick, and help to invigorate and sustain vital action throughout the system. It was observed with almost equal surprise that the rum and brandy customers at the mines of Cerro-Pasco escaped better than others in this epidemic. These alcoholic drinks would readily supply materials for the production of carbonic acid to be thrown off by the lungs. They would thus support animal heat and prevent exhaustion. Dr. Gallagher of the British Hospital, near Callao, found that brandy and water freely taken all through the successive stages of the fever, supported vital energy without ever producing over-stimulation in the severe yellow fever of 1856.

Above all things, pure air, and separation of the sick from the healthy, were found the great safeguards in preventing the spread of the fever, and the *sine qua non* of successful treatment.

It was a very usual practice to commence the cure of the disease with laxative enemata and aromatic sudorific drinks. Dr. Daza, early administered an emetic of ipecacuanha with tartar emetic, which was followed up by an evacuant of calomel and rhubarb combined, castor oil, or neutral salts. This treatment tended to preserve the equilibrium among the functions of circulation and secretion. Bleeding was another resource with this physician at the outset of his mission to Conchucos, when he bled largely and repeatedly in Piscobamba—afterwards he bled with more caution in Siguas; but latterly he abandoned venesection altogether in the province of Lampa. To this southern district he was recommissioned on his return to Lima from Conchucos. On Dr. Daza's route to Lampa, where he arrived on the first day of November, 1855, he saw thirty epidemized natives in different gradations of the fever at the Indian village Chiguata, which is five leagues from Arequinpa. He observed, that all these sick had the same general symptoms which he had been familiar with in Conchucos. We thus learn on the most competent authority that the epidemic in north and south Peru was of the same common nature.

Dr. Macedo believed, that in Huaras small bleedings had been usefully employed by him in persons of a sanguine temperament, and affected with the more severe hæmorrhagic form of the epidemic. He observed in such cases, that—"the blood presented no inflammatory buffy coat, had no firmness of consistence, and but little serum."

While the fever was strong Dr. Macedo allowed his pa-

tients acidulated drinks and ice, nitre and digitalis, whey and cooling enemata. Iced lotions, and the plug saturated with alumina or tannin, were applied to restrain excessive nasal hæmorrhage. When the stage of prostration had set in, he used pills, consisting each of one grain of camphor and one-fourth of a grain of opium, made up in extract of bark, for a dose: and to be repeated at intervals of two, three, or four hours, according to the degree of depression. Wine, soups, and a weak infusion of valerian were also administered. We are told, that by this tonic treatment many were cured. But in certain cases it was found requisite to deviate from this method, and he then used with advantage one drachm of Venice turpentine in four ounces of distilled water of orange flowers, made into an emulsion with gum arabic, of which a spoonful was given every two hours. He, likewise, had recourse to turpentine glysters made up with yolk of egg, which were found to remove abdominal pains and reduce the frequency of the pulse.

Again, in that non-hæmorrhagic, or congestive modification of the disease, called the "hepatic," by Dr. Macedo, when there was local pain or tumefaction observed in the region of the liver, this practitioner applied poultices, blisters, embrocations, sinapisms, turpentine epithems, or cupping-glasses as might seem most required. Besides, these topical applications, it was found advisable to adhibit a pill, consisting of three grains of calomel, and two grains of extract of rhubarb, repeated every two hours for twenty-four or forty-eight hours, with diluents, by which means the pulse became lowered and softer, and the general effect tranquillising. But in the stage of prostration of this hepatic modification, accompanied with delirium and coldness of the body, all remedies, we are told, were found to be almost equally useless, as death was generally inevitable. [See *El Restaurador de Huaras* of 11th November, 1854.]

After his return from Huaras, Dr. Mariano Macedo was recommissioned to the southern maritime department of Moquegua, of which Tacna is the capital. Whilst attending the sick of the epidemic yellow fever in this latter place, he experienced the great efficacy of the turpentine mode of cure in the hæmorrhagic form, having saved by it five out of eleven patients labouring under black vomit. But when this fatal symptom occurred in the congestive form, and during the stage of febrile reaction, he found turpentine of no efficacy. I may observe, that during strong febrile reaction in the hæmorrhagic form I have seen in my own practice, just as little success from

this remedy.* It has been in the stage of greater or less prostration, attended with black vomit, that we have seen what may be fairly called resuscitations achieved by turpentine, especially in patients of pure or predominating Indian blood. Dr. Macedo, further employed in the hæmorrhagic cases, just as the second period was initiated, the capsicum, camphor and opium pills, as prescribed by Dr. Copland, conjoined with the infusion of valerian or arnica.† This reanimating treatment we have often seen of great service in supporting the vital forces, and preventing the gastric hæmorrhage, in which turpentine has been found so efficacious. In the lazaretto of Ayacucho, Espinosa never bled his patients, except in a few instances in which the brain or lungs appeared to be in a state of excessive congestion. He was partial to the use of rhubarb with calomel administered early in the malady in three successive doses, with a view to anticipate intercurrent hepatic congestion, which, according to his own observation during ten months attendance at the lazaretto, Quicapata, was not unfrequently developed in course of the fever, but never manifest in its earlier period. In the hæmorrhagic variety of the disease he derived much benefit from the cold bath, which brought on reaction and sanitary sweats. He also employed turpentine enemata and epithems to the abdomen with good effect.

The city of Arequipa is situated in an oasis in the midst of a dry sandy desert, at the elevation of about 7,800 feet above the Pacific. It was observed in this dry locality, as in the equally dry city of Piura in North Peru, that yellow fever conveyed from the seaboard did not propagate itself as a general rule Many died outside in the suburbs, or on the arid plain and resting places (tambos) between the city of Arequipa and its seaport Islay. The periodical of that capital, "La Soberania," No. 35, has an article on the prodigies performed there by Dr. Adam Cridland with his "new treatment" of the epidemic. This consisted (as I have learnt from himself) of turpentine in large doses, suited to the necessities of the case. He observed, that in the invasion of the fever at Arequipa, head symptoms took precedence of the

* By referring to my notes, I find that this fact was remarkably illustrated in the case of the young Spaniard Francisco Ignacio Hurtado, who fell a victim to the disease in the Lima epidemic of 1854. I attended him in junta with Dr. C. Segura and Dr. Jose S. Corpancho.

† *Lima Medical Gazette*, vol. iii, No. 70. In one case of incipient black vomit, with great sensibility at the epigastrium, Dr. Macedo, in consultation with Dr. Wanne in Tacna, pushed mercurial treatment to salivation, and saved the patient.

gastric. In one remarkable case of a woman attended by him, the hæmorrhagic symptoms were so generally pronounced, that the blood filtered by the rectum, vulva, urinary passages, mouth, gums, nostrils, and punctæ lacrymaliæ. He applied ice to the spine, and administered as much as thirty-two drachms of turpentine mixed with gum syrup, before reaction commenced. When this change was established, he administered camphor and cinnamon with water and iced lemonades, by which means she recovered perfectly.

In Cuzco, bleeding appears at first to have been carried to excess, as it was reported that the epidemic of Sicuani was a catarrhal affection that was best cured by venesection and sudorifics. One worthy lady of my acquaintance, charitably paid two "sangradores," or bleeders on the occasion; but quaintly remarked, that both being dead of the epidemic, she did not find the poor died any faster than they did before. When Dr. Garviso arrived in Cuzco, he attacked the *modus medendi* of the Sangrado school. In his own practice, which he says was infallible, he discarded bleeding, blistering, emetics, and purgatives. In the milder cases, he used mild remedies, as laxative enemata and sudorifics. In the more severe cases, he relied on cold immersion and ergot of rye to restrain hæmorrhage. When needed, he supported the vital powers by tonics, antispasmodics and stimulants, such as phosphoric and sulphuric æther, camphor, cinnamon, tincture of valerian or castor, opium, ammonia, and quinine.

Pathological Remarks on the Sierra Yellow Fever.—One of the most general symptoms of this disease, was assuredly that yellow colour of the body, which gives this fever its distinctive name. To call it "bilious," is to assume that the icteric hue was the effect of a subordinate hepatic complication—a mere speciality. But that the yellowness was not dependent on hepatic lesion appears to me quite evident, when we reflect that it occurred in the more severe congestive as well as hæmorrhagic forms in Lima in 1854, wherein there was no hepatic inflammation or enlargement; that it was common to six out of the ten autopsies in Huaras with the five inspections in Tacna; and in seven out of ten in Huaras, the biliary ducts were free. Dr. Macedo* imagines that this outward appearance was peculiar to his "hepatic form" in the Sierra epidemic. We have shown from the observations of other practitioners, that it equally existed in

* *Lima Medical Gazette*, No. 51, p. 52, tom. iii.

the hæmorrhagic variety. In Tacna as well as Huaras, the outward aspect of the body in the examples of *post mortem* inspections, was not merely icteric, but dotted with mulberry coloured spots. These concomitants of the yellow skin are not intelligible on the theory of symptomatic jaundice. To explain this subcutaneous extravasation, we must find some one general principle or cause of disease independent of all minor accidents and special complications. In those violent cases where we have seen the victims cut off by a few hours illness, and the cuticular exudation tinge the bed and bed-clothes of the deceased, this effect could not be called hepatic, which was caused with the rapidity of a thunderbolt. In the year 1828, Dr. William McLean of Lima was on the river Plate, where he witnessed the cases of fourteen men struck by lightning, of whom nine were killed on the spot, and five recovered. The nine dead bodies had livid, or ecchymosed spots on the skin; and the five living men had the skin as yellow as it is ever seen in the most intense yellow fever. In this scathing example, I find the only fitting ground of comparison with the fulminatory instances of death during the period of invasion of the Sierra yellow fever, in which the results were evidently more toxicological than anatomical: the vitality and cohesion of the blood were at once assailed, and the healthy concatenation of every function of the system so suddenly subverted, that death necessarily ensued.

When we view the effects of this blood-poison in its more ordinary and less concentrated operation, and search for the inward traces of organic alterations which the fever may have left behind, the inquiry is not free of difficulties. The living history, or successive events of the case before us, may be imperfect or unknown, and the duration and character of the primary fever will essentially modify its ultimate complications.

In a memorandum with which Dr. Daza, when a member of Congress in 1860, favoured me, he says, "In Siguas, I observed that the prevailing anatomical character of the epidemic was a congestive state of the spleen; whilst in the colder temperatures of Puno, congestion of the liver was the predominant symptom, with a remarkable alteration in the duodenum. The mucous coat of this intestine presented a dark vinous colour, and it was easily torn."

Dr. Pedro Espinosa of Ayacucho, was surgeon-in-chief of President Echenique's army in 1854, attached to a force of about five thousand men of all arms, encamped on the

heights of Chongos and Chupaca, in the province of Jauja, Dr. Espinosa had two hospitals under his inspection. As yet, the epidemic yellow fever was not seen in this district; but in all cases where perspiration was medicinally sought for, there was difficulty in procuring it on account of the coldness of the climate. The sick could only be made to perspire freely under a heavy weight of bed-clothes. Thus, the diseases prevalent among the troops—such as, acute articular rheumatism, pneumonia, dysentery and *tabardillo*, were mostly of a "congestive and inflammatory kind."* With these facts before us, we cannot be surprised to learn that the epidemic fever in the colder regions of the Sierra, was accompanied in its secondary effects, with local complications of a congestive or inflammatory nature. It is to be regretted that we have no *post mortem* illustrations of the pathology of this epidemic, either from Ayacucho or Cuzco. But Dr. Garviso specifies among the symptoms observed by him in Cuzco, a severe pain in the sacro-iliac and coccygeal region. This, we may suppose, would imply some grave affection in the great intestine, similar in some degree, to that observed by Dr. Destruge in the epidemic yellow fever of 1842-5 in Guayaquil. In a letter, kindly addressed to me on the subject of that equatorial pestilence, Dr. Destruge related, that when the Indians from the highlands of Quito descended to Guayaquil during the reign of infection there, and were taken ill and died of the fever, he invariably found on examination of their bodies after death, that the rectum was in a gangrenous state. He also observed that this affection of the large intestine was peculiar on that occasion to the mountain Indian—the mixed and dark races were free from it.

The alterations in the liver noticed by M. Louis in the Gibraltar fever of 1828, and which were very observable in Lima in 1854, many physicians look upon as the constant and characteristic anatomical conditions of this disease wherever it occurs. But this conclusion is at variance with facts, observed in Spain and Peru.

In the Lima epidemic of 1854, the post mortem state of the liver was always found dry or juiceless.† But in the Tacna yellow fever of 1855, we learn from Dr. Macedo's inspections, that the liver was only found "*dry*" in one case, out of five examined, while in another it was diminished in

* Dr. Espinosa's letter of 16th April, 1859, in the *Lima Medical Gazette*.
† *Lima Medical Gazette*, tom. iii, No. 51, October 1858.

firmness of texture, but increased in size; and in a third subject, it was found to be softened and congested, &c. Here, then, at the comparatively low elevation of Tacna, 1816 feet, we see a great step made towards those hepatic complications and climatic alterations, which the same praiseworthy and laborious practitioner observed at the high elevation of Huaras; and which also occurred at the still greater height of Lampa and Puno, as noted by Dr. Daza.* It has been shown by the autopsies made in the lazaretto of Lima (at the elevation of five hundred feet) in the year 1854, that the intestinal mucous membrane presented spots of a more or less crimson colour, but in the majority of cases, as we are told by Dr. Macedo, without ulceration or softening of the membrane. In Tacna, again, in 1855, the intestinal mucous membrane presented in some cases very significant ulcerated points, and in every instance of five autopsies, softening of the mucous coat of the stomach, and other equally remarkable traces of degeneration of tissues in the large as well as smaller intestines: similar effects were seen in Huaras.

In Cadiz in 1800, in Medina Sidonia in 1801, in Malaga in 1803, there were great variations as to the external symptoms of yellow fever—such as petechiæ, icteric colour of the skin, and especially black-vomit, which last, Arejula did not consider an essential symptom, but merely an accessory fatal accident of the malady [Arejula, p. 145]. In Cadiz the liver was found to be much enlarged and softened, and of a colour passing from yellow to black. In Medina Sidonia the liver was observed to be clearer in colour than in its natural state, but of normal size and texture. In Malaga the liver was seen of large size, and with jasper-like brown spots, and of a firmer consistence than natural. The spleen also, was, in one case, found to be larger than in the normal state; and, in another case, this organ was entirely destroyed by suppuration; and the mucus coat of the stomach ulcerated or gangrenous. The lungs, in certain malignant cases, presented gangrenous portions, which had caused fatal hæmorrhages by the mouth.

Such facts as these, which I bring forward from the great Spanish authority on the subject of yellow fever, clearly evince that in Andalusia, during the specified epidemics, there was no specific diseased state of the liver, which could

* By Rivero's calculation of barometrical heights of places in Peru, Lampa is 3,901, and Puno 3,922 metres above the level of the sea.

be emphatically called the pathognomonic anatomical lesion of yellow fever.

In conclusion, Dr. Villar relates three cases of post mortem inspection practised by him during the epidemic of 1855-56, at Huancavelica in Peru, at the elevation of 3,798 metres (according to Ulloa as quoted by Rivero) of which the result was, that in all the three he found the stomach and intestines in a normal state, without any alterations in the follicles of Peyer nor of Brunner. The liver was hypertrophied extensively in two cases, one of which had the gall bladder full of biliary calculi, and in this, as in the other two, its consistence was slightly softened, but not so much so as the spleen. In the lungs the alterations were variable, as they were also in the brain—in one case of which, four follicles of pus were observed on the superior aspect. See *Lima Medical Gazette* of 30th Dec. 1857.

PATHOLOGICAL TABLE.

Drawn up from Dr. Don Mariano Macedo's published reports in the "Lima Medical Gazette."

It were to be wished that the columns confronted presented the same number of autopsies so as to render the comparison more complete; but they, each of them, respectively exhibit all the data in our possession on the necroscopical observations made in 1854, in Huaras, approximatively at the elevation of 10,000 feet, and in Tacna in 1855 at the elevation of 1,816 feet above the Pacific. The analysis of the ten Huaras *post mortem* cases is nearly word for word, as given by Dr. M. Macedo; the confronted analysis has been drawn up by myself from that physician's printed reports on the Tacna autopsies, only five in all.

Outward Aspect of Ten Cases in Huaras.		Outward Aspect of Five Cases in Tacna.	
Yellow colour of the skin in	6	Yellow colour of the skin in	5
Out of the above six there were mulberry-coloured spots on	2	Livid or mulberry-coloured spots on the skin in the	5
Petechiæ disseminated in three cases out of the ten	3		
The Liver.		*The Liver.*	
Increased in bulk in	7	Less juicy than natural in	2
A little larger than natural	2	Dry	1
Of natural size in	1	Somewhat softened and gorged with dark liquid blood	1
The parenchyma reduced to pulp	7	Somewhat increased in size, softened, and easily torn in	1
The parenchyma softened	3		
The colour of the liver was more or less a dark mulberry, and		The colour of the organ was of a	

spotted with capricious jasper-like figures, in	7
Of a darker colour than natural in	3
Gall-Bladder.	
Dilated in	6
Of normal size in	4
Biliary ducts free in	7
But narrowed in	3
Colour of the Bile.	
Green in	7
Of the appearance of black pitch	1
Colour of coffee	1
Colour of *chicha*, (or turbid beer)	1
The Spleen.	
Increased in bulk in	7
Of natural size and consistence in	3
Reduced to a state of pulp in	7
Stomach.	
The stomach dilated to more than one-third its normal dimensions	6
Stomach of natural size in	4
The mucous membrane entirely softened in	8
Mucous coat less consistent than natural in	2
The mucous coat presented on a ground more or less of a leady hue, mulberry-coloured or crimson spots, and was sprinkled over with red points or specks in	10
Small ulcers of various sizes	4
Contents of the Stomach.	
This organ contained a dark green liquid in	3
A liquid like turbid beer, or *chicha*	1
A liquid like the lees of wine in	1
A liquid like coffee with milk in	1
A free liquid of a yellow hue in	4
Small Intestines.	
Viewed externally, these presented more or less slate coloured bands, with vascular arborescent ramifications, in	10
At different points of the mucous membrane there were mulberry	

light rhubarb, or dried rose shade, with red, livid, or mulberry spots, and irregular arborescent jasper-like figures in	5
Gall-Bladder.	
A little dilated in	1
Less size than natural	1
Biliery ducts free in the	5
Colour of the Bile.	
A dark green in	5
The Spleen.	
Congested with black blood in	1
Somewhat congested	1
Natural state in	1
Of natural size, but softened, and breaks easily on being handled	1
Of small size and reduced to pulp	1
Stomach.	
The stomach dilated from one-fourth to one-third its natural size in	2
Dilated to twice its natural size in	1
Dilated, but to a less degree, in	2
The outward aspect of this organ was usually lead-coloured, and showed in some cases vascular ramifications.	
Viewed internally, the mucous membrane was completely softened in	4
Its consistence diminished in	1
The mucous coat partly leady-coloured, and partly of a dark red, with numerous red specks	2
The mucous coat with accuminated red specks disseminated	3
Dark coloured patches on the mucous membrane, and varnished with a muco-purulent matter	1
Contents of the Stomach.	
This organ contained a dark coloured sanguineous liquid in	3
A thick liquid the colour of coffee	1
A liquid the colour of soot in solution	1
Small Intestines.	
General appearance of the mucous membrane, from a dark leady to an ash colour, in	4
The mucous membrane presents red or dark reddish spots in different parts in	3

and leady-coloured spots in - - 10
In different places along the intestinal mucous membrane—and very particularly in the ileum—were seen minute ulcers grouped in bands on an ash-coloured ground in - - - - - - - - 5
The mucous coat entirely softened at different points in - - - - 9
Id. less consistent than natural - 1

Large Intestines.

Red spots and ulcerated points of different dimensions—the larger of six, and the smaller of two lines - - - - - - - - - - 2
Numberless ulcers, the smaller of four lines and the larger an inch—which latter *in one case* resemble dysenteric ulcers, with softened mucous coat, and lubricated by a thick dark fluid - 6
A thick sanguineous liquid in the ascending portion of the colon; the mucous coat of a reddish mulberry colour, with blackish transverse bands which looked like gangrenous scars, but without the characteristic odour; and ulcers at certain points with softening of the mucous membrane 1

Contents of Intestines.

The intestines varnished in different places with a dark green liquid of different shades of obscurity - - - - - - - - - 5
Varnished with a yellowish mucus 4
With a dirty fluid in - - - - - 1

Red spots meeting in arborescent outline - - - - - - - - - 1
Over the whole extent of the small intestines there is an eruption of small papillæ of an ash colour, but especially occupying about one yard in extent of the lower portion of the ileum; and, besides there are longitudinal bands on the same portion of the ileum, set with minute ulcers on an ash-coloured ground* - 1
The mucous membrane ulcerated and softened, so as easily to give way under the pressure of the nail in - - - - - - - - - 2
The mucous membrane softened, or less consistent than natural - 1

Large Intestines.

The mucous membrane of a dark leady hue, and at intervals presenting red arborescent stains, is notably softened and easily torn, ulcerated, and varnished with a thick leady-coloured fluid 1
The cæcum thickly coated with a muco-sanguineous matter like quince-jelly; and the remaining large intestines are covered with a thick sanguineous mucus, and the mucous membrane less firm than natural - - - - - - - - 1
The mucous coat with a sanguineous exudation in - - - - - 1
The larger intestines without any fluid, but with the mucous membrane less consistent than ordinary in - - - - - - - - - 1
The mucous membrane varnished with a dark liquid, but no other lesion, in - - - - - - - - - 1

Contents of Intestines.

The mucous coat of duodenum and other small intestines coated with a thick dark green liquid in 1
The mucous coat varnished with a dark fluid - - - - - - - 1
Do. varnished of a leady hue - - 1
Do. varnished of the colour of soot in solution in - - - - - - 1
The duodenum and part of the jejunum varnished with a thick liquid the colour of coffee - - 1

The above are, in abstract, the most remarkable anatomical

* *N.B.* These peculiar ulcerated bands on the ileum, with the special eruption noticed above, occurred in the case of Serjeant Villalba, who died on the third day of congestive yellow fever, with black stools and black vomit.

alterations observable in Dr. Macedo's *post mortem* inspections.

Both at Huaras and Tacna the few cranial inspections recorded, show that in several cases the dura mater was tinged yellow, that the sinuses and vessels distributed on the meninges were more or less loaded with blood, that the cerebral mass was more or less altered in consistence, and more or less dotted with red specks. In Tacna the valves of the heart were yellow, and its cavities contained dark fluid blood in four cases; in Huaras the valves of the heart were very yellow in one case, and in its cavities contained a yellow coagulum in two cases. The lungs in Tacna were livid in one case, and in Huaras partial hepatization and congestion occurred in one case. The texture of the kidneys sound in Tacna and Huaras. In Huaras the pancreas was sound in the ten cases, and in Tacna the pancreas is passed over in silence, which implies its soundness. In Huaras the urinary bladder was empty and contracted in five cases, dilated in one, and with the mucous coat sound in the ten. In Tacna the urinary bladder was contracted in two cases, and more or less distended in three; mucous coat of a yellowish colour but healthy texture in four, and of a yellow tinge, and dotted with red points in one. The urine was more or less discoloured or yellowish and turbid, in both Tacna and Huaras, in five cases.

I offer no comments on the numerous points of agreement in the above enumeration of morbid appearances among the cases examined in Tacna and Huaras. They are obvious at first sight; and wonderfully corroborative of the elective action of the morbid agent on the texture of the stomach and intestines, notwithstanding the great elevation of full eight thousand feet, and nine degrees of latitude, that separate the one place from the other.

NOTE A.

An epidemic, which much resembled the "mattazahuatal," broke out in Huamanga and Cuzco in 1719.20. In 1759 another epidemic, more like the milder forms of yellow fever, but of which our present limits will not allow us to treat at large, spread from the mountains to the coast with great rapidity, affecting domestic animals as well as the human race. (See Ulloa's *Noticias Americanas*, p. 202 3.)

NOTE B.

Lower down than Caras, in the warm and sugar-growing district of Huaylas, is the estate of Pumacocha, the property of Don Ignacio Figuroa, in 1860 a deputy for Huaras and senator in Congress. This gentleman gave

me the following particulars of the epidemic of 1854, as observed by him, on this estate of Pumacocha:—

"In the majority of cases, the invasion took place in the morning with headache, perturbation of mind, and pain at the stomach. By evening, the skin assumed the yellow hue, and then the great agitation ceased; patients thus affected remained quiet and complained of nothing, but on the morning of the following day they were dead, some of them voiding blood by mouth and nostrils, and others not. There was no black vomit, but some vomited matter of the colour of *dark coffee*. Out of one hundred and fifty individuals seized with this fever on the estate of Pumacocha, only thirty escaped with life. The negros, both male and female, were the last to be attacked, and none of them died of the epidemic."

NOTE C.

After the most careful consideration of this evidence, the following is the conclusion arrived at by the late lamented Dr. J. O. McWilliam, as communicated to me in a note from himself, dated November 9th, 1861:—

"It is the most stupendous instance we possess of the yellow fever having (as now begins to be acknowledged) extended beyond the limits assigned to it by Humboldt and almost all subsequent observers."

NOTE D.

Dr. P. Espinosa considers the epidemic, as seen by him in Ayacucho—at an elevation, probably, of about 9,000 feet—as a hybrid between the yellow fever and Tabardillo. As our *typhous* fevers are divided into typhus and typhoid, so the oldest practitioners of Peru, thirty years ago, distinguished their Tabardillo into simple *Tabardillo*, and the *Tabardillo-entripado*, which latter meant their *enteric* form of typhous fever.

For information of the usual modifications of type in the fevers of Peru, other than is given at p. 311, see my paper in the *Edinburgh and Medical and Surgical Journal*, vol. liii.

NOTE E.

It is worthy of record, in illustration of the facts mentioned, p. 312, that a year before this, Dr. Rosas, a vocal of the court of Arequipa, was, on his return from Lima, laid up with yellow fever at Islay. His colleague, Dr. Segar from Tacna, with his whole family and domestic establishment, to the number of sixteen or eighteen souls, were next seized with the same fever, some in a mild and others in a more severe manner; but Dr. Segara himself was taken ill on the 21st of April, and died on the 8th of May, 1854, with black vomit. It was thought this gentleman had caught infection from visiting Dr. Rosas during his illness.

NOTE F.

I was told by Don Miguel Criado that the dead bodies he saw in hospital at Cuzco were of diverse colours, such as yellow, blue and yellow, and also violaceous or livid, mottled, etc. This gentleman observed that in all cases the epidemic commenced with intense headache; and that in some, vomiting came on in the invasion, when the matter ejected soon passed from yellow to a mahogany colour, and finally to a dark green or black. Col. Aranzabal, who seeing the fatal effects of bleeding in Cuzco devoted himself to the hydropathic method of cure, confirms Senor Criado's observations, and adds, that the feculent motions often looked like "brea," or tar, and that the urine was of the colour of dark coffee.

ON THE RECENT EPIDEMIC OF DIPHTHERIA.

By J. N. RADCLIFFE.

(*Read February 3rd*, 1862.)

THE history of the recent epidemic best commences with the years 1848-49.* Prior to this period, diphtheria had been occasionally observed as a sporadic affection in various parts of the kingdom; and in the middle of the last century the disease, known by other designations, had prevailed in an epidemic form in several districts, as well as in France, Italy, Sweden, Holland, Germany, and North America. In both 1848 and 1849 cases of diphtheria had been observed in St. Thomas's Hospital in the metropolis;† and in one or the other year cases had also been noted in Herefordshire,‡ at Barton-under-Needwood in Staffordshire,§ and, about the same period, in the vicinity of Yarmouth, in Norfolk.‖

In the autumn of 1849 and winter of 1849-50, the disease prevailed in an epidemic form at Haverfordwest, Pembrokeshire. This outbreak is the first known occurrence of the disease epidemically in any district of the kingdom within the present century. Mr. J. D. Brown of Haverfordwest, a general practitioner, writing to the *Medical Times and Gazette*,¶ on the subject of diphtheria, towards the close of 1850, says:—"I have had the misfortune to see a great deal of it (diphtheria) during last autumn and winter in this town, where it broke out as an epidemic, and continued till the spring of 1850, and must have met, during its origin, with at least two hundred cases, forty of which were fatal.

"Its approach was often insidious, commencing generally with slight huskiness of voice, loss of spirits and appetite, but seldom or never any pain in swallowing. In this early stage, and often not at all during its whole course (?), parents

* Cases of diphtheria were observed at Sittingbourne, in Kent, in 1845, by Dr. Keyworth, of Birmingham (*Second Report of the Medical Officer of the Privy Council*); and Mr. Lambden, of Coningsby, Lincolnshire, states that he "has seen a case or two of diphtheria annually since he commenced practice in Coningsby: there are traditions among the country people of the occurrence of precisely similar cases as long ago as twenty-five years." *Privy Council Report*, p. 179.

† Dr. Keyworth, Sittingbourne, Kent. *P. C. R.*, p. 182.

‡ Dr. Russell, of Birmingham. *P. C. R.*, p. 182.

§ Dr. Webb. *P. C. R.*, p. 174.

‖ Mr. Cooper, of Cromer. *P. C. R.*, p. 184. ¶ Vol. xxii, p. 670.

would often wonder at the idea of there being anything at all dangerous the matter with their children, when, perhaps, at the same time the pharynx was perfectly coated over with false membrane, and the tonsils alarmingly swollen. In another hour or two all hope would be over, from extension of the disease to the larynx and œsophagus. In the severest cases, the attacks were often suddenly alarming, commencing with vomiting and shivering, loss of appetite, and general disturbance, without any throat affection as yet, which, perhaps, would not appear for four or five days, the stomach having evidently shown symptoms of the disease from the first. In all these cases the larynx was always simultaneously affected with the pharynx, the croupy symptoms being severe. Such cases were invariably fatal.

"In its course it was very uncertain. Some of the little sufferers appeared to get through easily; others, lingering for weeks with slight but still deceitful symptoms. The child would play almost with every evidence of perfect health, and enjoy the little sports of childhood as usual, when all at once the breathing would become croupy, the inspiration laborious; —the pharynx is attacked! The chances are now fearfully against him. No treatment seems to check it. Time is short, as every minute exhausts life. I have seen them die in four hours after such sudden invasions; they may linger four or six days, with deceitful intermissions of sometimes eight or twelve hours duration. The croupy symptoms would suddenly cease; the little sufferer would sit up, smile, eat, drink, amuse itself; the delighted parents would point to him with admiration of your skill; the sonorous breathing which to you told too plainly, at your last visit, that death was there, has disappeared, and, off your guard, you join in the general joy, and stamp it by promising him safe. Mark! such sudden changes are never to last—it is sure to return. When recovery is to take place, the changes are slow, hesitating, and doubtful for hours and days. Perhaps not more than four hours have passed,—you are sent for,—the frightful symptoms have returned, generally at night,—all now is over; the case is nearly hopeless."

In two cases, in which Mr. Brown had the opportunity of examining the bodies after death, he found that "the pharynx, tonsils, larynx, trachea, and bronchial tubes were more or less coated with false membrane; the larynx and trachea were thickly coated; the stomach showed symptoms of great irritation also."

In 1851, several cases of diphtheria (three children in one

family, two of whom died) were observed in the vicinity of London (Blackheath); in 1851 and 1852, several cases again occurred at Barton-under-Needwood, a lovely village, situated on the eastern boundary of Staffordshire, and very near the centre of the kingdom. In 1852, twenty-four cases, some fatal, are stated* to have occurred at Lifton on the Tamar, in Devon. In 1854, a typical case was noted in the General Hospital at Birmingham. In July 1855, Dr. Druitt saw two cases of the disease in Piccadilly;† and in September of the same year diphtheria broke out at Launceston, in Cornwall, and prevailed epidemically—the acme of the outbreak occurring in August of the following year.

It is an interesting fact that the two localities, Haverford-west and Launceston, in which diphtheria first manifestly assumed an epidemic character, are both situated in the two most westerly counties of the kingdom; and that the quasi-epidemic group of cases, observed by Mr. Doidge, of Lifton occurred in the district adjoining Launceston, on the East.

In the winter of 1855-56 (January 1856), five fatal cases of diphtheria occurred at Bromford Forge, near the river Tame (Erdington), in Warwickshire; and in the summer (June) of 1856 the disease broke out in a severe form at Beccles in Suffolk;‡ appeared at Whalpole Drove (July), a village ten miles from Spalding, in Lincolnshire; and at Leek (July), in Staffordshire, a town some thirty miles north of Barton-under-Needwood; and several cases occurred in Birmingham (Aug.). In autumn of the same year, the disease showed itself at Newick, in East Sussex (October), and at Ash, next Sandwich (November), in Kent; and in the winter following (1856-7) it appeared also at Rotherfield and Canterbury§ in the last-named county.

In the first five months of 1857, diphtheria was prevalent in Birmingham, where several cases had occurred during autumn of the preceding year; and in the summer of 1857, the disease appeared at Wolverhampton, in Staffordshire; also at Brewood, in the same county. The disease, moreover, showed itself for the first time at Aspley Guise, in Bedfordshire; at Fletching (July), Uckfield (July), and Mayfield, in Sussex; at Shelford, in Norfolk; St. Mary Cray, Kent; Colchester, Essex; and

* On the authority of Mr. Doidge, Union Med. Officer. *P. C. R.*, p. 244.

† Lady B—— and maid. *Sanitary Review*, vol. i, p. 361.

‡ Mr. Crowfoot, *Sanitary Review*, vol. ii, p. 302.—"A severe form of diphtherite, affecting primarily the mucous membrane of the pharynx, and in many instances extending to the larynx."

§ Severe cases of "diphtheritic inflammation of the fauces and tonsils" came under the notice of Mr. Reid. *Sanitary Review*, vol. iii, p. 89.

Teignmouth, Devon. In the autumn, the first case of the epidemic was observed at Spalding, in Lincolnshire (September); and the disease also first occurred at Dudley, in Worcestershire; West Bromwich, in Staffordshire; North Waltham, in Norfolk; at Chatham* and Brenchley, in Kent; East Hothly, in Sussex; and at Bolton-le-Moors, in Lancashire — the earliest record of the disease in the northern counties, and noteworthy as occurring in one of the westernmost.† In the winter of 1857-58, the disease was observed at Ashford, in Kent; Stourbridge, Worcestershire; Odiham, Hampshire; and at York.

In January, July, and March, 1858, the epidemic was at its height in Birmingham; and early in the year, according to some, but late, according to others, the disease appeared at Nantwich, in Cheshire. New centres of the epidemic were manifested in February, at Dursley, in Gloucestershire, and at Liverpool; in March, at Statham, in Norfolk; in April, at Lowestoft, in Suffolk, and at Portsmouth. In May, the epidemic broke out generally at Spalding, in Lincolnshire, and reached its acme at Coningsby, in the same county, and first appeared at Lincoln. And in June the disease showed itself at Witham, in Essex, and Sudbury, in Suffolk; while in the summer, autumn, and in December of the year, its presence was reported from one or more localities in every county in the kingdom, except Buckingham and Oxford, of the south-eastern counties; Hereford and Shropshire, of the west midland; the four northern counties, Cumberland, Durham, Northumberland, and Westmoreland; and the Welsh Counties.

In the course of 1859, the epidemic manifested itself in all parts of the kingdom,—the Registrar-General's returns of mortality for that year showing deaths from diphtheria in every county of England, and in North and South Wales. Adopting these facts, trustworthy doubtless as far as they go, it would appear that—

1. Diphtheria first showed itself in an epidemic form in South Wales and the south-western counties; and subsequently, but still prior to the general outbreak of the disease, in the eastern counties.

2. The general outbreak was preceded by at least four local

* This is doubtful: probably there were earlier cases.

† *Sanitary Review*, vol. iii, p. 414. Mr. Pendlebury, of Bolton-le-Moors, writes—"Several cases of the disease, lately noticed in the county of Essex, have been observed, but of a milder form. At the outset, these cases resembled ordinary quinsy, accompanied with great debility and general *malaise;* but the tonsils (on the second or third day) instead of suppuration, exhibited superficial brown sloughing patches."

outbreaks, at intervals (from the general outbreak) of seven (S. Wales), five (Lifton on the Tamar, Devon), and two years (Launceston, Cornwall), and of one year (Beccles, Suffolk).

3. The earlier of these local outbreaks occurred in districts near the coast, in the western and south-western provinces of the kingdom; the later outbreak in a district adjoining the eastern coast (Beccles, Suffolk). In fact, the epidemic was earliest manifested in the coast-provinces on opposite sides of the kingdom, the westerly having the priority in time.

4. Contemporaneously with the manifestation and in the intervals of the local outbreaks, scattered cases of diphtheria were observed in the eastern and south-eastern, north and west midland, and metropolitan counties.

5. With one exception (the cases observed at Barton-under-Needwood, Staffordshire), the examples of sporadic diphtheria recorded between 1848 and 1856, all occurred in districts which early became centres of epidemic manifestation of the disease.

6. The order of epidemic manifestation of the disease, in point of time, in the different districts of the kingdom, after 1855, was,—

In 1856,—1. The West-Midland counties.
2. The Eastern counties.
3. The South-Eastern counties.
4. The North-Midland counties.
In 1857,—5. The South-Midland.
6. The North-Western.
7. Yorkshire.
8. The Metropolis.
In 1858,—9. The South-Western counties.
1859,—10. The Northern counties, Monmouth, and Wales.

It would follow then, from these conclusions, that the impression first entertained* that the epidemic earliest showed itself in the south-eastern counties and travelled from thence, as a centre of infection, from station to station over the kingdom, does not hold good on a more accurate acquaintance with the first beginnings of the outbreak. The support which this belief was supposed to give to the theory that the chief agent in the propagation of the epidemic was contagion, falls to the ground with the belief itself. Subsequent observation, moreover, has shown that contagion plays but a very limited part in the epidemic extension of diphtheria.

The fact, however, that the theory of contagion being the

* See Mr. Hart's Report on Diphtheria, p. 19.

great agent in the spread of the disease, originated mainly in an imperfect knowledge of the times of appearance of the epidemic in different districts, is a significant hint of the importance practically, as well as scientifically, of such details as I have endeavoured to set forth. It is well, also, to bear in mind, *apropos* of the opinion which is, or may be held of the influence of contagion in the extension of prior, or of historical, epidemics, that, although the means for epidemiological observation which we possess surpass those possessed at any previous time, yet these are so imperfect, that the notion that contagion was the chief agent in the spread of the diphtheria epidemic, was at first very commonly admitted as a reasonable and just one.* This fact is a most unsatisfactory comment upon the epidemiology of the nineteenth century; but it will be admitted, I think, that the chief error rests in the want of any system of epidemiological observation, which can merit the name of scientific.

The times of occurrence of the forerunners of the epidemic, the scattered and disconnected centres of manifestation, and the slow growth, extending over a period of several years, would seem to point to developing causes, slowly originating over the whole, or the greater portion of the surface of the kingdom, and culminating more rapidly in the southern than in the northern districts.

Whatever were the causes leading to the epidemic, locality has played but a very secondary part in their development: for, in the period 1850-1859, within which diphtheria was developed over the whole surface of this country, the disease may be fairly described as pandemic. Within that period diphtheria was epidemic in many parts of France; in 1850, it was epidemic in Norway; in 1855, in Moscow, and it was also observed as the most prevalent throat affection in the French army in the Crimea; in 1856-7, it was epidemic in California, and various parts of the United States of America; and in 1859, in Australia and Nova Scotia.

The results of observations on the etiology of epidemic diphtheria have, hitherto, been chiefly negative. Drs. Greenhow and Sanderson's researches† have shown that there is no definite connection between the prevalence of the disease and the geological formation or the sanitary state of a locality. The malady has shown itself, in its utmost malignancy, on every variety of subsoil, and in the most healthy as well as unhealthy districts.

* The epidemic was at first known, among other names, by the term, *Boulogne fever*.

† See Appendix to *Second Report of the Medical Officer of the Privy Council*.

On the other hand, there are good grounds for entertaining the belief that individual and family peculiarities favour in an important manner the development of the disease.

To determine the influence of the physicial configuration of a locality upon an epidemic, requires a series of comparative meteorological as well as topographical and geological data, and these are not yet forthcoming in respect of diphtheria. The time has not arrived, indeed, when even the meteorology of the whole period of the general epidemic can be submitted to discussion, as our data lead us up only to the acme—supposing that to have occurred in 1859.

In the meanwhile, however, it may be usefully noted that, if we would successfully study the etiology of the epidemic, we cannot disconnect that study from the observation of allied affections prevailing contemporaneously.

If the mortality returns for the thirteen years, 1840-59, be examined, it is found that scarlet fever underwent a prodigious increase in 1858, and prevailed in that year to a greater extent than in any previous year of the thirteen. (2) That the mortality from *Croup* advanced year by year from 1854: that, in fact, the disease was epidemic in 1856, 57, 58, and 59, the epidemic culminating in 1858. The mortality from the disease also was prodigiously above the average, of preceding years; increasing from 3,660 in 1853, to 6,220 in 1858. (3) That the mortality from thrush also was greatly in excess in 1858 and 1859, though not to the same extent as in 1848 and 1852. (4) That the mortality from quinsy was in excess in 1857, and 1858, in the latter year attaining a higher point than in any previous year. (5) That the mortality from Noma had undergone a remarkable increase in 1855, 56, 57, 58, and 59, culminating in 1857. (6) That the mortality from laryngitis had undergone a steady development from 762 in 1847, to no less an extent than 1439 in 1858. In fact, it is not too much to say that *all the affections allied to diphtheria prevailed epidemically contemporaneously with diphtheria.*

The foregoing results give additional significance to unusual prevalence of sore-throat at the same time as diphtheria. Dr. Greenhow has aptly said that "diarrhœa and sore-throat are in some respects, congeners of cholera and diphtheria, from which their difference is less of character than of degree."

[Mr. Radcliffe proceeded to examine in detail the causes which had most contributed to the imperfect knowledge possessed of the early history of the diphtheria epidemic. He also suggested a scheme for the more accurate observation of epidemics, which has been submitted to a Committee of the Society.]

ON DISEASES AND INJURIES OF ARTISANS AND LABOURERS TRACEABLE TO THEIR RESPECTIVE OCCUPATIONS.

By ROBERT ELLIOT, M.D.

(*Read March 3rd*, 1862.)

ABSTRACT.

The object of Dr. Elliot's paper was to elicit a discussion on the practicability of instituting a general inquiry, through the Epidemiological Society, on the diseases and injuries of working (that is, "weekly-wage") people, resulting from the peculiar occupations of each class—the inquiry to be restricted to the *causes* and *prevention* of such diseases and injuries. An inquiry of this kind had so large a scope that it exceeded the powers of any individual observer; but its importance, if it could be compassed, was so great that it would be well to ascertain if it came within the limit of the objects of the Epidemiological Society; and whether the organization of the society was fitted for carrying into execution an investigation of this character.

At an ordinary meeting of the Society of Arts, on the 7th June, 1854, Dr. T. K. Chambers brought this subject forward, somewhat in the spirit and manner proposed by Dr. Elliot, but no results apparently followed, except an excellent report on diseases affecting the eyes. Other results might have been obtained, although unpublished, and might, perhaps, be available in subsequent inquiries however instituted.

The selection of the Society of Arts for labours so peculiarly medical was not perhaps very happy; inasmuch as the details were sought by that society through the aid of the many Mechanics' Institutes that connect themselves with it, and from the members of the different institutes themselves indiscriminately. All mechanics' institutes not being connected with the Society of Arts, and there being generally but one institute in each town, it followed that many towns would escape all inquiry, and those omitted might happen to be amongst the most important. Again, those included might, on the other hand, be comparatively unimportant. Then, if

all institutes had been included, there would have been few physicians or surgeons, or other enlightened and reliable observers, who would have become, by this mode of inquiry, the channels of the information sought for. One most valuable suggestion was, however, thrown out by a shoemaker in the course of the effort made by the Society of Arts. The suggestion was to the effect that the results of the inquiry should be published in parts, separating, if not each occupation by itself, at least each class, or section, or group of occupations, that presented similarity or identity of morbific causes or morbid effects,—as "dusty trades," or "foul and poisonous air trades," or "trades injurious to particular organs," as of the eyes, the skin, and so on. The reason given was a good one. Weekly wagemen cannot buy, and even will not read, large works; but anything like a tract or even a pamphlet, on their own trade especially, would be all the more likely to be extensively read and discussed by them, particularly if coming from the pen of medical men who have made the trade-injuries, from which they are liable to suffer, the object of peculiar study and research. The Society of Arts proposed to investigate each year only a portion of the subject. (See the *Journal of the Society*, vol. ii, No. 73, p. 364, 14 April, 1854.) In this there would be no advantage, but the disadvantage of exciting, at the time of publication of the results of the separate investigations, a very limited degree of interest in the inquiry. There would also be the risk of the inquiry being prolonged until all interest in it had waned away.

If the Epidemiological Society decided that an inquiry of this character was one that it might fittingly undertake, and with reasonable prospects of success, it would be well in pursuing the inquiry, and publishing the results, to adopt as simple a classification of trades as practicable. Dr. Elliot thought that one based upon the sources of the injuries and diseases arising from occupations, would probably prove most practicable and useful. He suggested the following classification:—

1. The Purely Chemical (*e. g.* Mineral Acid and Alkali Makers, etc.)
2. The Chemico-Physiological (*e.g.* Miners, Compositors, etc.)
3. The Physiological (*e. g.* Mirror-Silverers).
4. The Mechanical (*e. g.* House Carpenters).
5. The Mechanico-Physiological (*e. g.* Cutlers, Masons).
6. The Moral (*e. g.* Taproom Attendants).

[In the discussion which followed the reading of Dr. Elliot's paper, it was determined that no action could then be taken on the subject, by the Society, with advantage. G. M. and J. N. R.]

HISTORY OF AN OUTBREAK OF FEVER AT OVER DARWEN IN THE AUTUMN OF 1861.

By EDWARD HEADLAM GREENHOW, M.D., Fellow of the Royal College of Physicians; Consulting Physician to the Western General Dispensary; and Assistant Physician to, and Lecturer on Public Health at, the Middlesex Hospital.

(*Read April* 7, 1862.)

ALTHOUGH the ætiology of continued fever has engaged the attention of so many able inquirers during the last few years, it must still be regarded as unsettled, seeing that such various views are entertained on the subject by observers who may equally lay claim to ability and impartiality. The time has, I think, not yet arrived when we may venture to speak dogmatically on the causation of fever, but there seems to be no doubt in the minds of those who have enjoyed the best opportunities of studying the subject practically, that there is often an intimate relation between certain forms of this disease and local organic impurity, although the precise nature of this relation still demands the most searching investigation. At present we require additional facts rather than reiterated opinions towards the determination of this question; facts carefully observed and honestly reported, irrespective of their tendency to support any particular doctrine. And this is the course I have endeavoured to pursue in the preparation of the paper which I have the honour of submitting to the society on the present occasion. I have collected, partly from personal observation and inquiry, partly from the oral testimony of the local medical practitioners, all the trustworthy facts obtainable, relative to a very severe epidemic of fever; and, although no certain conclusions respecting the cause of the outbreak can be inferred from the evidence I shall lay before you, I yet trust that my paper may serve as a contribution towards that collection of facts from which we may hereafter hope to deduce the true causes of this disease. I may, perhaps, be permitted to add that the history of the recent epidemic of fever in Over Darwen well illustrates the truth of some observations I ventured to make here on a former occasion (November 1857); namely, the necessity for studying epidemic diseases, both during several successive visitations of the same disease, and in several

different localities. It also demonstrates the necessity of tracing the course of such diseases from their origin and following them to their close, if we would arrive at any definite view of their relation to special conditions of population or place. Unfortunately, the opportunity of doing so was not afforded me in the present instance, for I only heard of the outbreak a month after its commencement, and my inquiries in relation to it, which were made by direction of the Lords of the Privy Council, were limited to a few days. Notwithstanding these disadvantages, my inquiry being an official one, was made under the most favourable circumstances, and its results will, I hope, prove sufficiently interesting to justify my having brought even an imperfect history of a most remarkable epidemic under the notice of a society devoted to the study of such diseases.

The seat of the epidemic I am about to describe was, as I have just said, the little town of Over Darwen, in Lancashire; the particular form of continued fever of which the epidemic consisted was that first accurately described in England by my friend and colleague Dr. Stewart (in the *Edinburgh Medical and Surgical Journal* for 1840), and more recently by Dr. Jenner and other observers, and best known by the name of Typhoid Fever. Over Darwen is a small town in the vicinity of Blackburn, and situated about four miles from that town. It contained in 1851, a population of rather more than 7,000 persons, who were mainly employed in factory labour. The town consists of one straggling main street, nearly two miles in length, and of various smaller streets branching off from it on either side. It is situated in a narrow winding valley, and is hemmed in by hills on all sides. The principal street nearly follows the course of the valley, and of the brisk little river Darwen which flows through it. Some of the lateral streets on the side next the river are low and flat, but the greater number are situated on more elevated ground, and some of them are very precipitous. Near to the town are several large pools, or as they are locally termed "lodges," constructed for the purpose of storing water for the use of factories. These, collectively, expose a considerable surface of water, and sometimes of mud, to the action of the atmosphere.

At the time of the outbreak, the town of Over Darwen had long been in a very filthy condition, nuisances very dangerous to health having been allowed to accumulate almost beyond precedent. There was no perfect system of drainage for the removal of liquid refuse; and, indeed, very few of the houses had even the semblance of being drained. Foul privies, ash-

pits, and dunghills, were of frequent occurrence, and many of the smaller streets, being unpaved and destitute of proper channels, liquid refuse of various kinds was permitted to make for itself a course in the readiest direction. Night soil and other refuse had been permitted to accumulate in open receptacles, in almost all parts of the town, certainly during many months, in some instances it was alleged for several years, previous to the outbreak of fever. In many cases one of these receptacles served for several houses, which of course added much to the magnitude of the evil. These unwholesome conditions were aggravated and rendered more hazardous by the crowded state of many of the dwellings, proceeding from the prevalent custom of taking lodgers, on account of the insufficiency of the number of houses for the proper accommodation of the inhabitants.

Although its chief force fell upon that town, the visitation was not restricted to Over Darwen, but extended likewise to a small hamlet called Ryal, and to some neighbouring cottages in the adjoining parish of Tockholes. Cases likewise occurred at Cloyse's Farm, also in Tockholes, at Bury Fold, at Deal Fold in the parish of Withnell, and at Lower Sunnyhurst and Sunnyhurst Wood. Indeed, a few straggling cases shewed themselves in various parts of the surrounding country, and in the town of Blackburn, but the disease did not prevail in the epidemic form anywhere in the vicinity, excepting at Over Darwen and Tockholes. Whilst, within a period of three months, about fifteen hundred cases occurred in Over Darwen, and at least fifty in the hamlet of Ryal, the whole of the cases which came under the care of the parochial surgeons in the remainder of the extensive union of Blackburn, did not amount to one hundred during the entire year, and Dr. Grimes, the parochial surgeon for the district adjoining Over Darwen, who also attends the Union Workhouse and has one of the largest practices among working people in the neighbourhood, had only seen three cases, exclusive of a few sent into the workhouse, in the three months during which fever prevailed at Over Darwen and Tockholes.

Of the outlying places just named, the hamlet of Ryal, situated in the parish of Tockholes, consists of an isolated farm-house, that appears to have formerly been a manor-house, of a second farm-house separated from the former by a small field, and of a group of three or four cottages near to these farm-houses. These houses are all in an elevated situation, and stand relatively high as regards the land on the east, but lower than that on the west and south, in which direction the ground

slopes upwards towards a ridge upon which is situated a double row of twenty newly constructed cottages. The subsoil at Ryal consists of a tenacious wet clay immediately underlying a thin layer of mould. The situation is bleak and exposed, and, on one side at least, the land is undrained and imperfectly cultivated.

The first mentioned farm or old manor-house at Ryal contained seven inmates, consisting of the mistress, her children and servants, who all escaped the epidemic. The house was dry, in a state of exquisite cleanliness, and in all respects save one in the best sanitary state; the exception being the proximity of the privy and of a foul ditch, into which the ordure flowed until required for spreading upon the land. The second farm-house was lower than the surrounding ground by reason of the surface sloping gently upwards from the house on all sides. It was damp and closely surrounded by trees which impeded free ventilation, but no obvious nuisance existed in the vicinity of the house. The farm buildings, cow-house, and manure heaps were at a considerable distance, but the privy and a pig-stye were not far distant from the dwelling, and connected with them was an open ditch into which the soil passed. These nuisances were, however, more remote from the dwelling-house than in the case of the last named house whose inmates escaped fever. The family consisted of ten persons, seven of whom had fever, which in one instance terminated fatally. There were also two cases of fever among the inhabitants of the adjoining cottages.

The twenty recently erected houses stand upon a ridge from which the land descends on either side. They are, therefore, exposed to every wind that blows, and no local nuisances tainting the air with the products of the decomposition of organic matters existed in their neighbourhood at the time of the epidemic. The houses were then undrained, but did not appear to be damp. Each cottage was provided with a separate privy situated at the foot of a little yard or garden plot, and, being at least eight yards distant from the house to which it belonged as well as from the adjoining ones, could not in so open a situation prove a nuisance, and yet there were cases of fever in nineteen out of the twenty houses. Altogether there were at least forty-one cases in the nineteen houses, only one of which, however, proved fatal. With the exception of single cases in two distant parts of the parish, and of four cases at Cloyse's Farm, an isolated house at a considerable distance from Ryal, no other cases of fever had, so far as I could discover, occurred in the parish of Tockholes. The parish is extensive and contains several other hamlets, some of which

appeared to be less favourably situated than Ryal, as regards salubrity. One of the single cases was simultaneous with those at Ryal, but the cases at Cloyse's Farm occurred in the earlier part of the year previous to the general outbreak.

Bury Fold is distant from Over Darwen about a mile, in a south-easterly direction. The houses in which fever appeared are pleasantly situated in a woody dingle, immediately opposite to a "lodge" of water collected for the use of the neighbouring factory. Three cases of fever, one of which proved fatal, occurred in a household consisting of five persons, and a single case in an adjoining cottage which contained ten inmates. The inhabitants of several neighbouring cottages had enjoyed a perfect immunity from the disease down to the date of my visit.

Deal Fold is situated in the parish of Withnell comprised in the Chorley Union, and at a very considerable distance from both Ryal and Over Darwen. The soil consists of a dark loam overlying red sandstone. The ground immediately around the houses was dry and the surrounding country moorish, hilly, barren, and imperfectly cultivated. The dwellings, two in number, were under the same roof and occupied by families closely related to each other. Five cases, one of which proved fatal, occurred in one of these houses and two in the other.

There were two cases of fever in the same cottage at Lower Sunnyhurst, a small hamlet about a mile distant from Over Darwen. The hamlet consists of seven or eight cottages and two farm-houses. A lofty well-wooded hill intervenes between Lower Sunnyhurst and Over Darwen, and the little hamlet is situated in a rapidly descending dingle at an elevation of probably not less than an hundred feet above the highest part of Over Darwen. The neighbouring land is ill drained and boggy, and the dingle contains much wood. Seven cases of fever occurred at a little hamlet consisting of about six cottages, situated at Sunnyhurst Wood close to the brook of the same name, and about half a mile from Lower Sunnyhurst, but at a much lower elevation. Only one of these cases terminated fatally, and all the persons attacked were members of the same household; the inhabitants of the neighbouring cottages having entirely escaped the disease.

Although Ryal, Bury Fold, Lower Sunnyhurst and Sunnyhurst Wood are, properly speaking, not situated in the town of Over Darwen, they may be regarded as dependencies of it, seeing that many of the inhabitants work in factories at Over Darwen, or are in other respects in the habit of intimate intercourse with its inhabitants. The more distant outbreak at

Deal Fold, in the parish of Withnell, was included in the investigation, because fever was believed to have been introduced into the hamlet of Ryal by means of personal intercourse between the inhabitants of Deal Fold and some relatives who dwelt at Ryal—an opinion which my inquiries, as will hereafter appear, entirely disproved.

The fatal cases were registered under the several names of typhus, typhoid, and gastric fever; but the history of the disease, and the cases I saw, satisfied me that the epidemic might be properly regarded as one of typhoid fever. All the severe cases were of that character, although the milder ones were rather more ambiguous, and might, perhaps, more properly be designated febricula. The illness was sometimes ushered in with shivering and aching of the limbs and loins, followed by vomiting and pyrexia, with furred tongue. After a few days the disease, if the case proved severe, assumed the distinctive character of typhoid fever. The primary symptoms were for the most part mild, the sick being sometimes able to continue at work for several days after their seizure. Indeed, the disease was generally of so mild a nature, that many of the cases are said by the medical men to have terminated fatally in consequence of patients having risen from their beds, and having in some instances even returned to their work, prematurely. Diarrhœa occurred at some stage of the illness in most if not all of the cases, and was sometimes very profuse. It was frequently of a dysenteric character, being accompanied by much griping and tenesmus. Intestinal gurgling was frequently observed, and was found in all the bed-ridden patients. Diarrhœa was an early symptom in some of the worst cases, but more commonly this symptom did not set in until several days after the beginning of the illness. Hæmorrhage from the intestines occurred in an uncertain but considerable proportion of the severer cases; yet those in which it occurred are said to have rarely proved fatal. Copious sweating often appeared early in the illness, and continued until convalescence was far advanced. This symptom was perhaps partly caused, and was certainly encouraged, by the practice of heaping much bed-clothing upon the sick; but that this was not the exclusive cause, is evident from the circumstance that many convalescents who were already able to sit up, and other persons only just sickening, who had not yet taken to their beds, were found with a moist skin. Indeed, the great tendency to profuse perspiration was a marked feature of the epidemic. I found the pulse in no case higher than 110, and under 100 in several well marked cases of typhoid fever.

About the middle of October the disease began to be very frequently complicated with bronchitic symptoms, from which the earlier cases had been exempt. The characteristic rose-coloured eruption was seen in many cases, not only upon the abdomen, but also upon the thorax and neck, and sometimes in the bend of the elbow. Mr. Aspinall, a very intelligent medical practitioner at Over Darwen, reported that the eruption was sometimes so plentiful upon the chest and neck that these parts appeared to be studded with flea-bites; and Dr. Hindle informed me that this eruption sometimes extended all over the body. Deafness was a frequent concomitant of the disease, and delirium, sometimes succeeded by coma, occurred in a few cases, most frequently in those which were accompanied by profuse diarrhœa. When severe diarrhœa came on early, the case was very apt to prove serious.

The outbreak of the epidemic in Over Darwen was very sudden. It commenced about the last days of August or the first days of September, and spread with such rapidity that Mr. Wraith, the Union surgeon for the district, had one hundred cases under his care within a few days, and at least three hundred within the first three weeks; and the other medical practitioners of the town, together, must have had an even larger number. The first death from the epidemic in the town of Over Darwen, that of a young woman aged nineteen years, took place on September 13th, between which day and the 28th of December there were altogether sixty-one deaths. The main force of the epidemic was expended before the middle of November, but sixteen deaths were registered between the sixteenth of that month and the end of the year, and five more during the first fortnight of January. Only three additional deaths have been recorded between the 13th of January and the present time (the 7th of March). Altogether, therefore, sixty-nine deaths have been caused by the epidemic in Over Darwen. The outbreak at Ryal preceded that at Over Darwen, and there had also been scattered cases, or groups of cases, in the surrounding country from time to time during the previous spring and summer.

The greater proportion of the sufferers from the epidemic were young, comparatively few persons beyond the age of thirty-five or forty years having been attacked. It frequently happened that several members of the same family were simultaneously or successively seized with fever, the occurrence of single cases in households containing several young people having been rather exceptional. The mortality fell mainly upon young persons between the ages of five and twenty years, especially

while the epidemic was at its height. Out of sixty-seven deaths, eleven were those of children between the ages of two and five years; thirty those of young people between the ages of five and twenty years; fourteen those of adults between twenty and thirty years of age, and only twelve those of persons above thirty years of age. Of the latter, only four exceeded fifty years of age, and but one of these had attained his sixtieth year. The mortality fell more heavily upon females than on males, only twenty-five of the latter having died as compared with forty-three of the former.

The condition and situation of the dwellings in which the disease appeared, and the station of the persons attacked by it, were very various. The earlier cases all occurred in elevated situations on the hills, but these situations were all more or less damp, and surrounded either by moorish, or undrained, half-cultivated land. In the town of Over Darwen, the epidemic prevailed indiscriminately in houses situated at a low level, near the river, and in the more elevated parts. I took every possible opportunity of seeing cases, and inquiring into their history during my visits to the town; but it being manifestly impossible to inquire into the circumstances of every individual case, I contented myself with systematically visiting every house in which a case had proved fatal, besides any others which, either on account of the great number of cases which had occurred in them, or for some other reason, were pointed out to me as requiring special investigation. In these visits I directed my inquiries mainly towards the elucidation of certain points in reference to the causation of the outbreak, most of which will require separate notice, viz.:—

1. Whether the disease had commenced spontaneously or been imported.

2. To what extent the disease was associated with such local collections of organic refuse as could taint the air with the products of decomposition.

3. Whether the disease was connected with the ingestion of water impregnated with sewage or other organic impurity; and,

4. Whether the disease was propagated by contagion; and if so, in what manner.

1. The spontaneous origin of the disease in several instances appeared to be almost certain; at least no evidence of its having originated in contagion could be discovered on the most careful inquiry. In the parish of Withnell the outbreak was restricted to the inmates of the two houses at Deal Fold. The earliest cases were those of two girls who attended a

school at Withnell, which, so far as could be ascertained, was then, and has since continued, quite exempt from fever. Both there, and at Cloyse's Farm (where also an isolated outbreak occurred anterior to the general epidemic), my investigations failed to elicit any evidence which could lead to the supposition that the disease had originated otherwise than spontaneously. The four cases at Cloyse's Farm occurred as follows: the first in January; the second some considerable time after the first, but the precise date uncertain; the third in May; and the fourth in June or July. The three last cases formed a continuous series, and were nearly contemporaneous with those at Deal Fold, where the disease first showed itself in April.

In like manner, the first case at Ryal could not be traced to a contagious origin, the disease appearing to have sprung up spontaneously. A single case occurred in Ryal cottages early in May, and therefore about the same time with the cases at Cloyse's and Deal Fold, a circumstance which certainly appears to justify the inference that some peculiarity of season at least aided to develope, if it did not more directly originate the epidemic. For a time no further cases occurred, and this first case at Ryal had quite recovered some time before the commencement of the general outbreak. The latter commenced in one of the twenty new houses already described; and the person who first sickened had not, so far as could be discovered, been brought into relation, direct or indirect, with anyone suffering from fever. He was a stranger to the neighbourhood, who had only come to reside there in the previous March. His wife and infant, the only other inmates of his house, escaped the disease.

I was informed that the disease had been imported into Ryal from Deal Fold, by means of a married woman who resides at Ryal and is daughter to the person in whose house fever first appeared at Deal Fold, but, on personal inquiry, this story was entirely disproved; for though there had been frequent intercourse between the families during the illness at Deal Fold, the family resident at Ryal entirely escaped the epidemic, and indeed it is remarkable that theirs was the only one of the twenty houses in which there had not been at least one case of fever. I was informed, on the other hand, by many persons in Over Darwen, that the sick had not been exposed to contagion, but that their illness had originated spontaneously. Such statements, however, cannot be implicitly trusted, seeing that the epidemic was so generally diffused throughout the town, and that free intercourse had ex-

isted with the inhabitants at Ryal, and also between the sick and the well throughout the epidemic.

Perhaps the following facts, communicated by Mr. Aspinall after my return to town, may be regarded as affording collateral evidence in confirmation of that already given, that the disease, at least sometimes, originated spontaneously. A lady, the wife of a cotton manufacturer, residing in an isolated house situated on elevated ground, about half a mile distant from Over Darwen, was seized with fever on October 22nd. Her nurse was likewise taken ill of the same disease on October 24th, and a maid-servant on the 25th. It was reported that none of these persons had been exposed to contagion.

2. The disease was very frequently, but by no means invariably, associated with local organic impurity. The persons who suffered from fever at Deal Fold had not, so far as could be ascertained, been exposed to effluvia proceeding from organic refuse in a state of decomposition. The stable, cow-house, manure-heap, and privy, were indeed not far distant from the house, but they were more favourably situated than is common in small farmsteads, and so entirely out of a direct line with the dwelling, that the air within doors could scarcely be vitiated by any exhalations arising from them. The situation is elevated, the ventilation free; and these nuisances, if they could be regarded as such, were much further from the houses than is usual with similar accumulations of refuse in towns. The family had previously been a remarkably healthy one, and they had resided in the same cottage for more than forty years, during the whole of which time, it was said, the local arrangements had been identical with those in existence at the time when fever broke out in the house. No cause of atmospheric impurity was discovered in the vicinity of the new part of Ryal, and the other outlying places were equally exempt from local nuisances. Of the two farmhouses at Ryal, the inhabitants of that which was nearest to the privy and foul ditch, were entirely exempt from the disease which prevailed so severely in the other. It is, however, only right to state that the greater distance of the house from any source of effluvia was probably more than compensated by the deficient ventilation consequent upon its situation and the mass of surrounding foliage.

Accompanied by the chairman and several other members of the Local Board of Health, I visited eighty houses in the town of Over Darwen. There had been between two and three hundred cases of fever in these houses, and forty-three deaths, at the

time of my inquiry. Out of thirty-four houses, in which there had been fatal cases of fever, only ten presented unequivocal nuisances tainting the air with the products of organic decomposition. These nuisances consisted of foul privies, or other accumulations of human ordure. Nine other houses were probably, but less constantly, exposed to similar influences. The remaining fifteen houses were absolutely exempt from all suspicion of exposure to putrid exhalations. Of the forty-six other houses examined, two were closed and could not be seen; the inhabitants of fourteen others were exposed to effluvia arising from the decomposition of organic refuse; ten were more doubtfully exposed to such local influences; and twenty were exempt from them. I possess notes of the state of each house which was visited; but it would swell this paper to an inconvenient length, if I were to give in detail even a selection of the facts upon which the foregoing statement is founded. It is quite certain that the existence of fever in a house was not always associated with putrefactive accumulations in its neighbourhood; and equally so that the inhabitants of some houses, where the existence of such accumulations might have been expected to produce fever, entirely escaped this disease. It might indeed be asserted, that the atmosphere of the whole town was poisoned by exhalations arising from the great accumulation of filth which existed previous to and during the epidemic; but, if so, these exhalations were not perceptible to the senses, and we are not justified, in scientific inquiries, in assuming that which cannot be proved.

3. The epidemic of typhoid fever at Over Darwen was by popular consent attributed to the bad quality of the water supplied to the inhabitants from the reservoirs of the waterworks. These are two in number; the service reservoir, situated at the "Hills" near the town, but at a considerable elevation above it; and the Ernsdale or "compensation" reservoir, situated at the distance of a mile and a half from the former, and at a still higher elevation. The Ernsdale reservoir has been formed by damming up a brook, and is likewise fed by land drainage and by a supply of water brought in an open conduit from the vicinity of Lower Sunnyhurst. The water in the Ernsdale reservoir was beautifully clear, bright, and pure looking; that in the service reservoir a little discoloured, and less bright. The service reservoir is fed partly by springs, partly by water brought from the Ernsdale brook previous to its junction with the Ernsdale or "compensation" reservoir, and partly by water gathered from land drainage and other

sources, poured into the conduit in its course from Ernsdale to the "Hills". These sources are only supplemented when necessary by water drawn from the Ernsdale reservoir.

A committee of the Over Darwen Local Board of Health, appointed to examine into the nature and source of the water supply, report that it is evident a large amount of drainage from manured land percolates through the sides and top of the water-course which conveys water to the service reservoir at the "Hills". Higher up the stream than the point at which water is taken from it to supply the service reservoir, the Ernsdale brook is fed by a stream from Tockholes, which is said to receive all the drainage from the twenty new houses, and also from the farm houses at Ryal. But, in reference to this statement of the committee, it must be observed, that the twenty new houses had no proper drainage until after the fever had expended itself at Ryal, and that, although the drains which were being laid at the time of my visit run in the direction of the Tockholes brook, they received none of the liquid from the privies, which, if it escaped at all, flowed away in the opposite direction, and could not possibly contaminate the water supply of Over Darwen. I lay the more stress upon this point, because, whatever may have been the cause of the foulness of the Tockholes brook, it could not consist in any appreciable degree of the secretions from the intestinal canal of fever patients. Moreover, although the Tockholes brook is certainly now polluted in some way, the specimens of impure water were in all probability not taken for examination until after the drainage of the twenty houses had been completed. At my suggestion, the Local Board of Health directed specimens of water to be taken from a tap near the extremity of the pipes at Over Darwen, from the service and Ernsdale reservoirs, and from the Tockholes brook above the point at which water is drawn from it to supply the service reservoir, and sent to Dr. Angus Smith of Manchester for analysis. Dr. Smith did not analyse the specimens perfectly, but reports that the amount of matter in suspension is very small, and could scarcely be estimated. All the specimens contained traces of ammonia, and, especially that taken from the Tockholes brook, a decided amount of phosphoric acid. Of the four waters analysed, that from the Ernsdale reservoir was the purest, that from the Tockholes brook the most impure, while those taken from the service reservoir and the tap held an intermediate place between the two former. The water from the Ernsdale reservoir contained 2·7 grains of organic and volatile matter per gallon; that from the service reservoir and the tap 3·0 grains; and that from

the Tockholes brook 3·7 grains per gallon. All the specimens contained common salt, but that from the Tockholes brook considerably more than twice as much as any of the other specimens, which only differed from each other by a slight fraction, and contained each rather less than one grain per gallon.

In support of the opinion that the outbreak of fever was due to the use of impure water the committee furnish certain statistics gathered by means of a house to house inquiry throughout the town. It is endeavoured to be shown by these statistics that fever was both more prevalent and more fatal among that section of the population which drank the water-works water than among that which drank water procured from other sources. I do not quote the figures in detail, because I have good reasons for regarding them as untrustworthy, just as all statistical or other scientific inquiries must be when made by persons unskilled in such investigations. But, receiving them for what they are worth, and believing them to be quite honestly taken, I find that the committee visited 1765 houses containing a population of 9,908 persons supplied with water from the waterworks, and 386 houses containing a population of 2,051 persons supplied with water from other sources. It appears, from the statement of the committee, that there were fever cases in 733 of the former class, and in 145 of the latter class of houses, while the inhabitants of no less than 1032 of the houses supplied with water from the reservoir and 241 of those supplied from other sources, were quite exempt from the epidemic. The population of the houses of the former class stricken with fever amounted to 4,644, of the latter class to 797. Of houses exempt from fever those supplied with water from the waterworks, contained a population of 5,264, and those supplied from other sources a population of 1,254 persons. Thus, according to these statistics, considerably more than half the houses supplied with water from the reservoir were exempt from fever. These facts, at least, afford no support to the opinion that the use of impure water was the cause of the outbreak. Indeed, considering how intimately the water must have become mixed in its course through the conduit, in the reservoir, and subsequently, in the pipes (a fact also proved by Dr. Smith's analysis which gives almost identical results for the specimens of water taken from the pipes and service reservoir), it seems unlikely if the water contained any special poison capable of producing fever—whether this were the product of organic decomposition or a secretion from the intestinal canals of fever patients—that more than half the population drinking

this water should have entirely escaped the influence of the poison.

But there are still other reasons for doubting the supposed relation between the ingestion of impure water and the fever in Over Darwen. An analysis of the facts contained in the report of the Local Committee seems to show that the two sections of the population drinking water from different sources, differed greatly also in other respects; for, first, not only were the houses of the people supplied with water from the public reservoir somewhat more crowded than those of the people who obtained water from other sources; but, secondly, the section of each of these populations that suffered from fever appears to have been much more crowded in their houses than that which escaped the epidemic. While each of the 733 fever stricken houses supplied with the suspected water contained on an average 6·3 persons; the 1032 houses supplied with the same water, but which were exempt from fever, contained each on the average only 5·1 inhabitants. In like manner, while each of the 145 houses inhabited by those who did not drink the suspected water and yet were visited by fever, contained on the average 5·5 persons; the 241 houses of the same section of the population in which no case of fever occurred, contained each on the average only 5·2 persons. In other words, fever occurred in that portion of the population which dwelt in the most crowded houses; and the greatest proportion of cases and the largest mortality occurred in that section which, besides drinking the suspected water, was the most crowded in their dwellings. I do not infer from this that over-crowding was the main cause of the epidemic, I merely state the fact as tending to shew that, probably, other influences were at work besides those to which the fever has been attributed. Probably, where the dwellings were over-crowded, other unhealthy conditions, such as poverty, deficient nourishment, and uncleanliness within doors as well as without, were not absent. Most probably, also, that section of the population which inhabited the least crowded dwellings comprised those who had at their command all the necessaries and luxuries of life, and whose dwellings were in other respects in a more favourable sanitary state.

Another reason for doubting the relation between the use of the suspected water and the epidemic of fever is afforded by the circumstance that most certainly the outlying cases could not proceed from this cause. The water used by the people at Deal Fold, Ryal, and Cloyse's was obtained from perpetually flowing springs, and was taken at their point of exit

from the earth in situations where contamination appeared to be impossible. That used by the people of Lower Sunnyhurst and Sunnyhurst Wood was taken from rapidly flowing brooks which had all the appearance of being perfectly pure.

4. Although fever appears to have originated spontaneously at Withnell, Ryal, and Cloyse's, and probably also at Over Darwen, several facts were elicited during the inquiry which seem to indicate that it might likewise have been contagious. The proofs are not quite conclusive, but the facts at least deserve to be mentioned. If the single case in May, which had quite recovered before the more general outbreak, be disregarded, the earliest case at Ryal, that of a man named Baxendale, appeared, as already said, to have been spontaneous. The second was that of a girl, named Worsley, who was supposed to have contracted the disease from Baxendale, to whose house she was in the habit of going daily. The third case was that of another girl who had been in frequent communication with the Worsleys during the time of the sickness in their house, in which eventually there were seven cases. The subsequent progress of the disease at Ryal could not be traced: the greater part of the people work in a factory, and, with a single exception, there was free communication among them. The exception was that of the inhabitants of the farmhouse already described, who were seven in number, and had all, excepting one elderly female, who went to and fro between her house and the Worsleys during the time of their illness, taken special precautions to avoid contact with the sick, and whether on this account or not escaped the epidemic.

The medical practitioners of the town, who had the most favourable opportunities of observation, believed the disease to have been contagious. Dr. Hindle related the following example in illustration of the cases which had led him to entertain a belief in the contagiousness of the disease. The niece and maid servant of a person of respectable station had frequently gone to visit a relative sick with fever. Hitherto the uncle's household had been exempt from the disease; but eventually, after this intercourse with the sick household had continued for some time, both the niece and the maid-servant sickened, almost, it was said, on the same day, with the prevailing disease. The situation and other circumstances of the house in which these people lived were said to be in all respects unexceptionable.

A large proportion of the inhabitants of Over Darwen work in factories; and, in many cases, the first persons attacked in particular houses were factory operatives. Thus the first case

in a house, No. 1, Duckworth Street, was that of a short timer in a factory. About fourteen days after he sickened, another member of the family, also a factory operative, became ill of fever. In another house, No. 20, Hacking Street, the first of six cases, was that of a factory operative. Three cases occurred at No. 7, Tythe Barn Street. The first sufferer was a factory operative, who had worked next to a man convalescent from fever. The other members of this household only became ill three weeks after the first; and there was no cause of atmospheric impurity about the house itself to which the sickness among its inmates could be imputed. A fatal case at Shorrock's Fold was likewise that of a factory girl. Soon after she sickened the man who worked at the same loom with her also fell ill with fever. A farm labourer died of fever at No. 6, High Street. There were four cases in his house, the two first of which were factory hands. The two first cases at No. 23, High Street, where there were altogether seven cases of fever, apparently quite unconnected with any definite local impurity, were young women who worked in a factory. The first case at Bury Fold was that of a factory operative, and the same observation applies to at least eight or nine other households, in which satisfactory evidence of the exact sequence of the cases was obtained. These facts rather point to the conclusion that factories were the foci of the disease, but there are many factories in Over Darwen, and the most careful inquiry failed to discover that any one of them in particular had formed a centre from which the disease could have spread.

Sometimes factory operatives were the only members of a household that suffered from the epidemic. Thus at No. 27, Hope Street, out of nine inmates, the only one who had fever was a boy who worked at a factory. All the cases at Lower Sunnyhurst and Sunnyhurst Wood, were also those of factory hands, though they did not all work in the same factory. In these and a few other instances, though factory operatives took fever themselves, yet this disease did not spread among the other members of the household. Other remarkable examples of immunity where persons had been in direct communication with the sick, were observed. One of the daughters of Mr. Worsley left her home during the prevalence of fever in the house and slept at a neighbour's house only a short distance off. She went backwards and forwards between the two houses during the day-time, yet she neither took fever herself nor conveyed it to the family with whom she stayed. The family that resided in that one of the twenty new houses at Ryal which was alone

exempt from fever, had been in frequent intercourse with the families at Deal Fold while they were suffering from it, and were afterwards in constant communication with their neighbours during the epidemic. There were several other well authenticated instances in which persons who had been in close communication with the sick escaped without injury. Upon the whole, a careful consideration of all the circumstances which I could authenticate leads me to the conclusion that, although some of the facts which have been related are rather in favour of the contagiousness of the disease, yet that those facts may be explained in a different manner, and that therefore the evidence falls short of demonstration. Indeed, as stated at the beginning of my paper, the facts I have ascertained relating to this very remarkable outbreak of Typhoid Fever are incapable of affording any certain conclusion respecting the causation of this disease; for as we have seen, these facts are of so various a character that, taken separately, they are capable of affording evidence in support of any one of the several existing theories of the origin and mode of propagation of Typhoid Fever.

NOTES ON THE RECENT PREVALENCE OF YELLOW FEVER IN SEVERAL OF H.M. SHIPS ON THE WEST INDIA STATION;

AND THE RECENT INTRODUCTION OF THE DISEASE INTO THE PORT OF HALIFAX, WITH REMARKS ON THE CLIMATE, ETC., OF HALIFAX.

By DR. SLAYTER, Health Officer of the Port.

(*Read June* 2, 1862.)

HALIFAX is situated 44° 40′ north latitude, and 63° 31′ west longitude. It is built on a promontory and nearly surrounded by water, and lies on a slope opposite one of the noblest harbours in the world. Its position is admirably adapted for sanitary purposes. There is a well arranged system of sewerage; the houses are not overcrowded, and actual want is unknown amongst the population.

The temperature in the hottest days of summer seldom exceeds 80°, and is generally below 75°.

The soil is dry and free from alluvial deposits, and from those miasmatic influences so necessary for the propagation of contagious diseases.

All these circumstances tend to render Halifax the safest rendezvous for seamen suffering from that direful scourge, yellow fever, which prevails so extensively at times in the intertropical regions of America.

From Port Royal which she left on the 22nd of June, the *Firebrand* arrived at Halifax on the 8th of July, 1861. I was told by the surgeon, on boarding her, that he had seventy-nine on the sick-list, all fever cases, and that during the passage from Port Royal, there had been ten deaths from yellow fever.

The scene which presented itself was very distressing; many of the sick were in *articulo mortis*. The atmosphere of the between decks was impure, the port-holes having been closed in consequence of stormy weather. The attendants were exhausted from constant watching, and dejected from the dread of the disease. The ship had been at Carthagena upon the Spanish Main, and in the inner anchorage there for fifty-eight days. Constant communication was daily kept up with the shore. By night the effluvia from the mangrove swamps conveyed by the land-winds to the ship were intoler-

able. The crew, while on duty on deck, complained of a sensation of sickness produced by the foul air. There was no fever known to exist on shore at the time. On the 7th June, she left for Jamaica. Several cases of remittent and intermittent fever were on the sick-list; they excited no suspicion. Shortly after this, the disease increased, and showed undoubted symptoms of yellow fever.

There being no quarantine hospital at this port (Halifax), I recommended the admiral, Sir A. Milne, to have the sick removed to Bedford basin, which is a continuation of Halifax harbour, and to have them encamped on an island called Stevens' island. The locality is healthy, and was formerly used for fever patients, being isolated from the city. To carry out my suggestion was considered inconvenient; therefore the sick, with the permission of our city authorities, were allowed to be transferred to the hulk *Pyramus*, lying in the stream opposite the naval hospital in H.M. dockyard. The convalescents and some of the healthy were landed, and sent to a storehouse set apart for their accommodation in the dockyard. The officers occupied apartments in the Commissioner's house, which is but a short distance from the storehouse. This was considered the only quarantine regulation necessary. Dr. Lewis, senior assistant-surgeon of H.M. ship *Nile*, volunteered to attend the sick in the hulk; he discharged his duties so much to the satisfaction of the naval commander in chief that he has since been promoted.

Some of the *Firebrand's* crew were appointed nurses, and some were left on board to attend to the cleansing, ventilation, &c., of the ship. There were fifteen convalescents, thirty convalescing, and thirty-four seriously ill at the time. On the 8th of July, an assistant engineer was attacked in the Commissioner's house, forty hours after his landing. He was immediately removed to the hulk, and in about twenty hours after removal died with black vomit.

In about a week or ten days, some of the convalescents in the hulk were removed to the naval hospital in the dockyard, and placed in a ward adjacent to one occupied by patients not having fever. A quarter-master, left in charge of the *Firebrand*, fell overboard while intoxicated; he complained of debility and loss of appetite, and was in consequence sent to hospital, where he was placed in one of the non-contagious wards. He died on the 23rd with black vomit. A nurse from the hulk attacked with the fever was also sent to the Hospital; he recovered.

There were in all eighty-four cases treated in this city: sixteen died in the hulk *Pyramus*, and two on shore in the hospital.

From the commencement of the disease in the *Firebrand*, 107 of her crew (which was in all about 170) were attacked, and forty-nine died.

The *Spiteful* arrived on 16th August, 1861, at Halifax, from Nassau in the Bahamas, which she had left on the 9th. Eleven deaths had occurred during the passage, and there were forty-six cases of fever on her arrival. She had arrived at Nassau from Havannah on the last day of July. Ten sick were landed at the hospital in Nassau; and at the time of her leaving that place, there were thirty-eight cases on the sick-list. On arrival at Halifax, nineteen of the sick, along with nurse attendants from the ship, were sent to the hulk; and two moribund remained on board; they died that night. The remainder of the crew, including the convalescents, were landed next day in the dockyard. Some of these sickened on shore with the fever, and were sent to the hulk. One of the nurses also in the hulk took the disease, making the total number treated in Halifax thirty-three, of whom twelve died.

It was supposed that the disease was now finally arrested; but, on the 31st, a man who had been employed in the *Spiteful's* hold, was attacked, and died on the 5th September, with black vomit. On the 1st of September, another man who had been engaged in a similar duty took the disease; and on the same day, a boy servant in the officers' quarters, who had had frequent communication with the infected ship, was also attacked. Both died on the 6th September.

The *Spiteful* had in all eighty-eight cases of the fever, and thirty-six deaths.

The *Jason* arrived at Halifax on the 2nd of Sept., 1861, from the Gulf of Mexico, which she had left on the 13th of August. Between the latter date and the 31st of July, twenty-five cases of yellow fever and six deaths had occurred on board. During the passage, forty-six fresh cases and ten deaths took place.

Immediately on her arrival, two of her officers were attacked; they with all the rest of the sick were landed and sent to a building in the dockyard. On the 4th, two of the crew sickened on shore; one of these died. Between the 5th and 9th, five cases more were added to the list (one was in a nurse of the fever ward); all recovered. The total number attacked was seventy-nine; the deaths seventeen.

The *Racer* arrived at Halifax on the 3rd of Sept., 1861,

from Nassau; she had suffered severely from yellow fever while at Havannah, and during the passage from that port to Nassau, which she had reached on the 19th August. During the voyage to Halifax, there were nineteen fresh cases and five deaths. The more serious cases were at once removed to the temporary naval hospital. Next day, three mild cases were added; and on the 14th, nine days after he had left the ship, a man was seized; he died on the 20th with black vomit. The total number of cases was sixty-one; of deaths twenty.

The entire complement of officers and men of these five ships was 855.* Of these, 499 were attacked, and 162 died. This gives a proportion of attacks at about fifty-eight per cent; and of about thirty-two per cent of deaths to those attacked.

The *Barracouta* arrived at Halifax on the 4th September from Port Royal, which she had left on the 20th August. Two cases had occurred during the passage; one was fatal. No fresh case occurred after this date.

The *Mersey* arrived at Halifax on 12th October, having contracted yellow fever at Havannah. She had had twelve cases and two deaths. Dr. Slayter remarks in reference to this vessel:—"The mildness of her attack was doubtless owing to the admirable system of ventilation pursued on board (all the port-holes being left open), and also to the celerity with which she made the voyage, being under steam from her departure from Havannah to her arrival at Halifax; for which promptitude in thus placing the vessel beyond the reach of excessive heat, and other causes which would have aggravated the contagion, too much praise cannot be given to her captain."

The *Ariadne* arrived at Halifax on 27th September, from Bermuda. During her stay here, one case is reported to have died from yellow fever; but I am unable to state any particulars, as I am not in possession of any facts relating to her. The cases, however, were very few; and there was no spread of the disease after her arrival here.

In concluding the preceding narrative, Dr. Slayter says:—"I am happy to state that none of the people about the dock-yard, or in the city took the disease."

Thermometric range. The thermometer at Halifax in July was never above 78°; and at night it ranged from 55° to 59°. One night, it was 52°. Dr. Lewis states that one day it was 83° on board the hospital ship *Pyramus*. In

* There must have been another sickly ship besides those enumerated; probably the *Icarus*.

August, on two days it was 79½°; but generally it was below 70°, and at night from 49° to 54°.

It will be seen from the preceding statements that, contrary to expectation, the yellow fever continued in undiminished virulence, as in the two cases first cited, in the northern latitude of Halifax. The thermometer, however, in the early part of July, was not much below the intertropical standard, although the nights were mostly cool. The fresh cases in the *Firebrand*, which occurred in this harbour, I need not specially allude to; in them, no doubt the germ of the disease existed before they left the ship, or were removed from immediate contact with the sick. The three last cases in the *Spiteful*, however, and the last case in the *Racer*—in both of which malignant yellow fever, after a very considerable interval, attacked and rapidly carried off its victims—shewed the length of time over which, even in a temperate climate when the weather was cool, the period of incubation may extend; supposing that these cases did not arise from contagion or localization, for it must not be overlooked that the four sufferers (as was no doubt the case with many others who escaped) had been employed on board their respective ships cleaning and refitting them.

The following case appears to me to afford very strong proof in favour of the contagious character of yellow fever. The *Rinaldo*, a new ship commissioned for the first time, arrived here from England on 29th July; and it being necessary to make some alterations on board, all her crew were placed on board the *Pyramus* in the first week of August; they remained there till the 16th of that month, when they cleared out, owing to the arrival of the *Spiteful*, and returned to their own ship. On August 7th, a man named Friend was received into the naval hospital from the *Rinaldo* (not from the *Pyramus*) with gonorrhœa; he was placed in a ward with six other patients, three of whom were convalescents from yellow fever, belonging to the *Firebrand*. He (Friend) was discharged on the 21st to the *Rinaldo*, all but well, and that ship sailed on the 23rd for New York. As she was entering that harbour four days afterwards, a boy who had been employed in one of the boats whilst in Halifax, and had lived in the *Pyramus* and had frequent communication with the *Spiteful's* people in the dockyard, was taken ill, and died of yellow fever with black vomit on the fourth day after attack. The day after the boy was put on the sick-list, two stokers (one of whom was Friend) who had been in the hospital on shore and never in the hulk, were also seized

with yellow fever. Friend died with black vomit on the same day as the boy. The other man recovered.

Where did the *Rinaldo* contract the fever? Decidedly at Halifax in the month of August; the boy either from the hulk, or more probably from the *Spiteful's* people in the dockyard, and the stoker too undoubtedly from the *Firebrand's* convalescents in the Hospital.

The sad history of the epidemic in the vessels now recorded is certainly suggestive of some needed improvements in the sanitary regulations, for the guidance of H.M. naval commanders on this station. Had the *Icarus* and *Firebrand* at once steamed for this place on the first introduction of the disease, many valuable lives in all probability would have been saved. In the case of the *Spiteful*, had it been possible to have sent her northward, instead of remaining from the 31st July to the 9th August, what a different result would have happened! And the length of time that the *Racer* spent at Havannah after the disease had broken out, is certainly to be deplored.

On account of the healthy state of our climate, our local Government has hitherto considered it an unnecessary expenditure for the erection of a quarantine hospital. The subject, however, will be brought before them at an early period; and the past summer's experience teaches the necessity for a more vigilant attention on the part of the naval authorities to our sanitary orders, and also the want of a suitable building wherein to transfer the sick on their arrival in this port.

The principal diseases met with here are of an acute inflammatory kind, and occasionally an epidemic of one of the exanthemata. A classification of the deaths cannot be obtained, as there is no correct registry of deaths kept, and consequently no reliable data.

Cholera has not visited us since 1834, although an epidemic prevailed in the adjoining province a few years ago. *Diphtheria* has been prevalent for the past six or seven years, but chiefly in the interior of the country and province; and in some parts it has been very fatal.

Vaccination is not insisted upon amongst the poor, there being no legislative action taken on the subject, Halifax therein differing from many of the other colonies.

When the small-pox breaks out, the city authorities employ several medical men to go about the city, and vaccinate all those who are willing to submit to the operation.

A recent epidemic of small-pox lasted for fifteen or sixteen months — viz., from May 1860, to September 1861.

With the exception of sending two surgeons about the town to vaccinate, and the removal of some of the cases to hospital, no very energetic means were taken to check the spread of the disease. Three hundred and twenty-seven cases were admitted into the hospital, and of these forty were fatal. At no one time, was there any great amount of the disease.

To an impartial observer one would have imagined that the Board of Health was either in league with the medical faculty, or that epidemics were of such rare occurrence that this sanitary body regretted their departure.

Subsequent History of the Jason.

[It is always instructive to follow the health-history of a fever-stricken ship. Mr. Slayter transmitted to us the following interesting particulars respecting the *Jason*, upon her return to Halifax at the end of April 1862. The fever, it will be observed, was typhoid in the early cases, and subsequently assumed the true yellow character in the Gulf of Mexico. G. M.—J. N. R.]

H.M.S. *Jason* after losing nineteen men from a fever which had developed itself in the Gulf of Mexico, started from Halifax on the 15th November, 1861, to return to the station from which she had been compelled three months before to withdraw. All the fatal cases had been recorded as cases of genuine yellow fever.

Before leaving Halifax, the ship had been cleansed out, and accumulations of filth had been removed from places inaccessible before. Obstacles to the discovery of filth had been taken away, in the shape of strainers or roses placed across the bilge under the tanks, and in other localities out of sight and reach. Bulkheads which prevented the free circulation of air had been taken down, and additional hatches had been cut both on the upper and lower decks. Moreover, the *Jason* was returning to the tropics at the season of the year which is considered the healthy season for Europeans. Nevertheless, on the 22nd November, in latitude 27° 39′ and longitude 73° 22′, and when the thermometer was 73°, two men presented themselves with fever. Both died with typhoid symptoms, one after nine days, and the other after thirty-four days. In December, the ship being then at Sacrificios, and when the thermometer at noon averaged 75°, only two slight cases of fever occurred. In January, the average thermometric heat at noon being 74½°, one case of typhoid fever appeared on board. The man re-

covered after a tedious illness of forty days. On the 31st of January, a severe case of remittent fever was entered on the sick-list. The man had joined the ship in good health at Halifax; he had been one of the crew of the *Driver*, wrecked on the coast. This patient was ultimately sent in a convalescent state to Port Royal hospital, after having had several relapses and forty days illness.

On the 14th February, a stoker, who had worked on the railway for several hours at Vera Cruz, was put on the sick-list with remittent fever, which after a time became complicated with dysentery. This man was invalided, as his case had the appearance of being very protracted. In February, the average noon heat was 68½°. No other case of decided fever occurred during this month. In March, the average heat was 74°. Twelve cases of fever were placed on the sick-list. Early in the month they were of greater or less severity, but none of alarming seriousness occurred. Towards the end of the month, although no marked increase of temperature had taken place, the weather became close and muggy, and the "northers" ceased. On the 22nd, a blacksmith, who some time before had been employed in work on shore, was put on the sick-list with a severe attack of fever. On the 23rd, a man who had never been employed on shore; on the 28th, a marine who had served on shore; on the 29th, another man who had had yellow fever last year; on the 30th, another man who had never been out of the ship; and on the 1st April, another who had been one of the Marine Brigade, were successively attacked.

With one exception, none of these men previously had yellow fever. In the exceptional case, the attack was slight and the man returned to duty after six days' illness. The patient who sickened on the 22nd recovered after fifteen days illness; he who sickened on the 23rd, died of yellow fever after four days and a half; he who sickened on the 30th, died with black vomit after three days and a half; and he who sickened on the 28th is now convalescent, although he had black vomit in its incipient stage; and he who sickened on the 1st of April is also convalescent.

The *post mortem* appearances, in the case attacked on the 23rd, confirmed the opinion as to the true nature of the disease. The skin and eyes had become of a deep yellow, and the stomach contained black vomit.

After the case which occurred on the 1st of April till that of Marsh placed on the list on the 15th, seventeen cases in all presented themselves. With the exception of one, now

convalescent, none were of any severity. There were no fresh cases for upwards of two weeks before her arrival in this port.

Between the date of the *Jason's* leaving Halifax and the first decided case of yellow fever, the disease may not have been extinct, but merely dormant, in the ship. The cases of typhoid fever may have been cases of yellow fever modified by a Nova Scotia autumn and a tropical winter.

This much is known that, as soon as the "northers" ceased and the atmosphere became close and muggy towards the end of March, yellow fever appeared. There was nothing in the state of the bilges, as far as appearances went, to account for this; they were kept as clean as it was possible to keep them; still they did smell strongly occasionally.

Before decided yellow fever manifested itself, the health of the ship's company had not been satisfactory. There was observable a tendency to fever in many of the cases of catarrh, diarrhœa, and dyspepsia, placed on the list. The surgeon did not like this; for he had observed the same tendency last year before the outbreak of yellow fever which caused the ship to retire from the Mexican Gulf, and not without reason, as the result shewed.

I think it was fortunate for the crew of the *Jason* that yellow fever appeared so early in the season as it did; for had they remained there for some time longer till the temperature increased, they might have returned to the north repeating that experience of last year, burying a man almost every day. They left Vera Cruz not a day too soon, and in a few days found themselves in a different climate, and the yellow fever ceased.

Between the date of their leaving Halifax and the present date thirty-seven cases in all—returned as fever—occurred. Of the whole number, only three had had yellow fever, or any form of fever, last year. The cases of these men were such as to cause no anxiety as to the result; they, in fact, resembled irregular intermittent or remittent fever.

VITAL STATISTICS OF TASMANIA IN 1861.

By Dr. SWARBRECK HALL, of Hobart Town.

(Read July 7th.)

THE deaths recorded in all the registration districts of Tasmania in 1861, Hobart town and Launceston included, were 1472; to which must be added seven of convicts which are not stated in the public registers. On the total Tasmanian population on the 7th April 1861—viz., 89,977, the rate of mortality would be a trifle more than 16·25 per thousand, or one death in about 60·85 individuals.

The sixty-three healthiest registration districts of England and Wales have a death-rate of seventeen per thousand, and this number is assumed by the Registrar General as a normal standard of mortality. The comparison speaks volumes for the climate advantages of Tasmania; though at the same time every sanitarian who has studied the subject must confess that our salubrious climate has hitherto been much counteracted by man's neglect, and that, when the laws of hygiene in our domestic and municipal arrangements are properly applied, the annual rate of mortality may be very much reduced. No hygienic inquirer can assert that, even in the rural population of this island, there is not a considerable number of preventable deaths constantly occurring from neglect of sanitary precepts. Yet out of a rural population of 53,677, exclusive of those associated with the urban districts of Hobart town and Launceston, the deaths in 1861 only amounted to 619, or one in 85·7 of the inhabitants,—being a mortality rate of only 11·25 per thousand. Glendale in Northumberland, the lowest in the English returns, has fifteen per thousand. Moreover, the juvenile proportion of the Tasmanian population is much greater than in England and other European countries. This fact is constantly overlooked by those who institute comparisons in which this disparity forms so important a consideration, and consequently the results deduced by them are vitiated. By the census of last year, the children under fifteen years of age constituted about thirty-eight per cent of the whole of the Tasmanian population; while in England, at the census of 1851, those of the corresponding age only bore to the whole the proportion of 35·5, and in France of 33·16.

To those versed in vital statistics, the relative proportion of deaths at different ages will convey convincing information

of the propitiousness of this climate to human life. Of the 1479 deaths in 1861 only 323 were under one year of age, notwithstanding the great preponderance of infants to the mass of the enumerated population; 124 were between one and two; 53 between two and three; 22 between three and four; 40 between four and five; and 67 between five and ten. The last three groups were all above the usual proportions, owing to the prevalence of the measles.* There were 62 deaths between ten and twenty; 105 between twenty and thirty; 151 between thirty and forty; 169 between forty and fifty; 146 between fifty and sixty; 107 between sixty and seventy; 60 between seventy and eighty; 28 between eighty and ninety; 3 between ninety and hundred; 2 upwards of a hundred. Of ages unknown, there were 10.

The total registered births for all Tasmania, in 1861, were 3,207, or one in 28·5 of the population. It is, however, known by every census taker that a considerable number of births are never duly registered; so that the real number of living births in 1861 would probably be not much short of 4000. No account is taken of still births; but the registered births would be nearly 2¼ to every single death; in other words, the population of Tasmania from births alone in excess of deaths increased by 1728 during 1861. In England, from 1838 to 1855, one birth to every twenty-nine persons took place; and in France only one to 34·5; but the births in proportion to deaths in England were only about three to two; and in France as seven to six.

The year 1861 was remarkable in Tasmania for the great rain-fall, 28·19 inches, exceeding the twenty years standard mean by 6.61 inches. It was so equally divided also that eight months out of the twelve had an excess above the month's average. October and December were both remarkable for much the largest amount that had ever fallen in these months, in the previous twenty years. At no time during the year, did the rain ever fall so heavily as to cause floods.

This valuable sanitary lesson—for no doubt the great rain-fall contributed largely to the healthiness of the year by the purification of both air and water—so frequently impressed upon us by Nature's teachings, we shall soon be able to apply advantageously by artificial means, when the new water-works are completed.

* The measles, which had not visited Hobart Town since 1854, commenced in February. The first case was clearly traced to a girl from Oatlands. Fifty-five cases proved fatal; and most probably the mortality would have been greater, had not the meteorological condition of the year generally been so favourable to health.

NOTE ON DIPHTHERIA IN PERU.

By Dr. ARCHIBALD SMITH.

(*Read July 7th*, 1862.)

I HAVE known Peru since 1825, but never saw or heard of diphtheria there as an epidemic until 1858-59. In the former of these years, it proved very fatal among children; in 1859 it was less prevalent, and consequently attended with fewer deaths.

The termination in children was usually by suffocation, I think. The remedies relied upon chiefly were emetics at the invasion, and after that cauterization with acid nitrate of mercury when the membrane was formed or forming in the fauces. This practice, though very efficient for adults, sometimes produced extreme irritation among children. On this account, some practitioners rejected the treatment, and preferred leeching and emollients. Some used calomel in small and repeated doses up to a certain mark, indicated by the appearance of the stools, as used to be our practice in croup; others, again, trusted exclusively to the chloride of potash internally, as well as topically applied. I believe all these methods, when timeously resorted to and judiciously used, were followed by good results in many instances.

The disease was superinduced on the following epidemic sequence, as noticed in Lima, the capital of Peru, which is situated six miles from the sea, at the elevation of 500 feet, with a winter temperature of 60-64° Fahr. as minimum, and summer heat of 80-84° Fahr. as maximum. Atmosphere generally humid, and climate relaxing. Barometer all the year 29½ to 29¾, if I recollect well.

Malarial and pythogenetic causes are always fertile sources of disease, such as intermittent, remittent, and typhoid fevers; the sewage gas is often extremely offensive; and it is by no means uncommon to see the intermittent pass into the declared typhoid form, while pure typhus, *per se*, is seldom seen in civil practice, as far as I can judge from my own experience.

In 1851, reigned in August and September a catarrhal fever, or influenza, which extended all over Peru.

1852. A mild adynamic fever, with a red cutaneous erup-

tion, which attacked all but destroyed none, like the "Polka" of Brazil, which Dr. Lallemant called the first stadium of yellow fever.

1853. What may be called an epidemic nascent yellow fever, terminating with a few cases of black vomit by the end of autumn.

1854. Yellow fever in aggravated form.

1855. No yellow fever, but epidemic intermittents.

1856. Intermittent disappears, and yellow fever returns.

1857. In August and September catarrhal influenza.

1858. Diphtheria as epidemic.

1859. Diphtheria on the wane, and small-pox prevalent.

Remark. This last year (1859), on the third or fourth day of high fever, I was called to see a youth, when I observed the false membrane on the throat and fauces; and next morning, on return, I found the diphtheria vanished, and eruption of small-pox fairly established.

ON DR. A. HIRSCH'S "HANDBOOK OF HISTORICO-GEOGRAPHICAL PATHOLOGY."*

By HERMANN WEBER, M.D., F.R.C.P., Physician to the German Hospital.

(*Read July 7th*, 1862.)

THE following communication on Dr. Hirsch's *Handbuch der Historisch-Geographischen Pathologie* is given in compliance with the request of the Council of the Epidemiological Society, to which Society the distinguished author has dedicated his work. The nature of the contents of this important work is, however, such as not to allow of their being condensed in a short abstract. I will, therefore, endeavour to give an idea of the character of Dr. Hirsch's researches, by describing the manner in which he treats several diseases, and groups of diseases.

The sphere of geographical pathology, as laid down by the author, is to show in what manner the various forms of disease are spread over the surface of the globe; what differences are observed in the phenomena of the various diseases, as they appear in different localities; in how far the various conditions dependent on, or connected with, the geographical position, as race, nationality, terrestrial and social relations, and climate in general, may be considered as essential to the existence and spreading of certain diseases; how the single forms of disease are related to each other as to space, whether some exclude others, or occur more or less constantly together; finally, whether and what changes have occurred in the geographical distribution of diseases in the course of time, and what connection may be found between these changes and those in the social and climatic relations of the various localities.

Dr. Hirsch arranges the various diseases under three heads, viz.: 1, acute infectious or zymotic diseases; 2, chronic constitutional diseases; 3, diseases of organs.

The first volume, which is completed, treats of the acute infectious, and the chronic constitutional diseases; the second volume, which is not yet entirely published, but is fast ap-

* Handbuch der Historich-Geographischen Pathologie. Bearbeitet von Dr. August Hirsch in Danzig. Erlangen, Verlag von Friedrich Enke. Vol. i, pp. 614, 1859; vol. ii, part i, 1861.

proaching completion, is devoted to the diseases under the third head.

To the epidemiologist, the *acute infectious* (zymotic) *diseases*, which occupy the first three hundred pages of the volume, form the most interesting section of the work. The diseases treated under this head are: 1, malaria fevers (pp. 5-60); 2, yellow fever (pp. 61-110); 3, cholera (pp. 111-148); 4, typhus fevers (pp. 149-192; 5, the plague—*a*, the Oriental plague, *b*, the Indian plague (pp. 192-214); 6, small-pox (pp. 214-224); 7, measles (pp. 225-234); 8, scarlet fever (pp. 235-242); 9, erysipelas—*a*, erysipelas simplex, *b*, erysipelas nosocomiale, *c*, erysipelas neonatorum, *d*, erysipelas typhoides (pp. 242-255); 10, febris miliaris, suette miliaire, or Schweissfriesel (pp. 256-272); 11, dengue (pp. 272-276); 12, influenza (pp. 277-300).

The pathological description of the diseases is almost entirely omitted, as belonging to works on special pathology. The author was the more entitled to this plan, as his work forms a supplement to Virchow's *Handbuch der Speciellen Pathologie und Therapie*. Hirsch gives first the geographical distribution, and the most important historical points connected with the appearance of every disease; he then considers the influence of race, soil, climate, etc.; and finally, the coincidence or antagonism of the various diseases as to space and time.

Under the term *malaria fever*, the author comprises a group of diseases which, though different in their symptoms, yet are analogous with regard to their anatomical and pathological peculiarities, as also with regard to their occurrence and distribution as to space and time, and may therefore be considered as modifications of the same morbid process which is known under different names as malaria fever, autumnal fever, marsh fever, ague, periodic fever, remittent fever, bilious remittent fever, according to the locality in which it occurs and the nature of the symptoms.

The malaria fevers are remarkable on account of their endemic predominancy, and their wide spread over the globe. In their greatest virulence and frequency, they are met with in the hot and tropical regions; but they extend far beyond the temperate zones, although in a milder form. Dr. Hirsch gives a detailed list of the principal localities of the malaria fever in different parts of the world, from the west coast of Africa to the healthier portions of Europe and Australia. The author remarks that these fevers sometimes occur epidemically, in localities also which are usually exempt, and that in such instances they are generally spread over large tracts of country,

even over the greater part of the surface of the earth, and seem then to be the forerunners of other pandemic infectious diseases.

In favour of this assertion, Hirsch mentions the general appearance of malaria fevers in 1558 (according to the testimony of Palmarius Foresti, Gemma, and Stow), which malaria fever epidemic was followed during the four subsequent years by the plague, while typhus fevers spread over almost the whole of Europe. Again, there was a pandemic of malaria fevers in 1678 and 1679, which, during the three years following, was succeeded by the plague. The third malaria fever epidemic, occurring between 1718 and 1722, preceded a general appearance of typhus fevers; the same was the case with the epidemic of malaria fevers between 1807 and 1812, and again with that between 1824 and 1827; the typhoid fevers which followed after the last named epidemic, were in their turn succeeded by the cholera in 1832; and this latter disease followed again, in 1848, the general spread of malaria fevers between 1845 and 1847.

Among the different forms of malaria fevers, the *common ague* is by far the most general and the most widely spread; it is rarely altogether absent where any of the other forms occur endemically or epidemically; its principal habitat, however, is in the temperate and cold regions, while in the tropical and subtropical regions it is generally confined to the mountainous portions, or to the plateaus, as, for instance, in Peru and Mexico. In the southern part of the temperate zone, too, the simple ague is especially met with in the drier and higher situations, as on the table land of Spain, in some mountainous parts of Upper Italy, of Southern France, and of Turkey. The *remittent fever*, although very prevalent in some parts of the eastern hemisphere, as on the western coast of Africa (Senegambia and Guinea), in Abyssinia, in the plains of the Nile and the Euphrates, in the marshy parts of Hindostan, of Ceylon, and other islands of the Indian Ocean, in some portions of the peninsula of Italy, in Dalmatia and Turkey, seems to be still more widely spread over the western hemisphere, and especially over that part of America which lies north of the equator; there it is a very frequent disease, not only in the tropical and subtropical regions of Guiana, Central America, and the West Indian islands, but endemically, and sometimes epidemically, in many parts of the United States where other species of malaria fevers are scarcely known. The marshy coasts of the Southern States, and the banks of their rivers, are especially the seat of remittent fever; which prevails, also, near the shores of the Erie and Ontario lakes,

where it is known as the lake fever. As far north as the lower course of the St. Lawrence river, and particularly so in Quebec, remittent fever is, according to Boyle, often met with, passing over into simple ague. The so called *febris perniciosa* seems to be the least prevalent of the various forms of endemic and epidemic malaria fever, although it occurs frequently during epidemics of remittent fever, and assumes as such occasionally an epidemic character.

Hirsch does not adopt the view that the shorter stages of the paroxysms, and the longer intervals between them, as in tertian and quartan intermittent fevers, are peculiar to the higher latitudes, the longer stages of the paroxysms and the short and imperfect intervals, as in remittent fevers, to the tropical and subtropical latitudes; but he thinks that the type of the fever depends on the intensity of the morbid influence which, in general, is more powerful in hot climates, but under many circumstances becomes very active in higher latitudes and less so in the tropical and subtropical regions.

Dr. Hirsch, after having given the geographical distribution of the various forms of malaria fever, examines the different circumstances which seem to exercise an influence on their character and spread.

Race and *nationality* seem to be without influence on the occurrence, geographical distribution, and character of these fevers. *Acclimatization* is of more importance, as people born and residing in malaria districts seem less liable to be attacked than those coming from non-malarious districts. *Colonization, immigration,* and other movements in *the social life* of mankind exercise an indubitable influence on the spread and character of malaria fevers.

The dependence of the origin of the malaria fevers on *meteorological conditions* is evident: (*a*) From the influence of the *seasons* which manifests itself more in the subtropical and temperate than in the tropical regions. Thus in Egypt, Algiers, North America, Syria, Asia Minor, Persia, Caucasia, Hungary, Turkey, Greece, the Ionian Islands, Italy, Spain, and the South of France, the endemic fevers begin, in general, between June and August, and last until the commencement of the colder season. In Germany, the North of France, Holland, England, Sweden, and Russia the fevers usually begin to appear in spring, decrease in frequency during the heat of the summer, and reappear in increased number at the very commencement of autumn, ceasing at the end of this season. The following notes of Dr. Hirsch on the times of commencement of a large number of epidemics in different climates are of great

interest. Of twelve epidemics in the tropic zone, two began in March, two in May, five in June and July, two in September, one in November; of thirty-nine epidemics in the subtropical regions (Algiers, Italy, Ionian Islands, South of France, North America) four commenced in spring, twenty-eight in summer, seven in the beginning of autumn; of two hundred and thirty-seven epidemics in the northern latitudes (North of France, Holland, Germany, England, Scandinavia, Russia) sixty-one appeared in spring, one hundred and seventeen in summer (the majority in August), fifty-five in autumn, and four in winter.

(*b*) The influence of the *humidity of the air and soil* is very generally acknowledged, as in the tropics fevers seem to begin during or soon after the rains, and are more general and violent in wet years; and in the temperate climates, too, the prevalence of fevers is observed to be greatest, if a wet spring is followed by a hot summer.

(*c*) In intimate connexion with atmospheric moisture, and of still greater importance is the *temperature*. The facts that the disease becomes rarer and less violent as we proceed from the equator towards the north pole, and that in temperate climates it ceases during the winter, and is most frequent in warm years, render the influence of an elevated temperature almost indisputable.

(*d*) The *Sirocco* is accused by the Italian physicians of causing an increase in the frequency and violence of the fevers in Sicily and Italy, but it cannot be considered as proved that the wind can carry the malaria poison to a great distance.

The examination of dependence of the malaria on *geological* conditions leads to the consideration of (*a*) the elevation, (*b*) the mineralogical character, (*c*) the quantity of organic detritus, and (*d*) the degree of moisture contained in the soil. The *elevation* in itself seems to be without influence, as, according to Tschudi, fever exists in Peru at an elevation of 10,000 feet above the sea, and in the Pyrenees, too, in some elevated regions. The geological quality of the soil in itself, too, appears to be only of secondary importance, as the disease is found endemic on sand, lime, clay, granite, and other soils, but it appears to make the greatest difference, whether the character of the soil, as well the upper as the subjacent strata, be such as to permit an easy flowing off of water, or whether it be such as to prevent this; experience having shown the disease most frequent and most intense where the soil is soaked with moisture rich in organic detritus, as in marshy countries, on shores subject to periodic inundations. The author does, however, in spite of the very frequent and

most important connexion between marshiness of the soil, and the endemic prevalence of malaria fevers, not adopt the *paludal* theory of malaria, as there are considerable fever districts where no such marsh influences can be discovered. As instances of such districts, he mentions: (1) the Castilian plateau, which is an extremely sterile table-land with scanty water supply and sandy soil; (2) the plain of the Araxes, likewise a tract of desert country surrounded by a range of sterile hills of volcanic constitution; (3) the Persian plateau of Iran; (4) the Tuscan Maremme, the Campagna di Roma and Calabria, the plains on the west of Italy rising towards the Appenines, all of which possess the same geological character, being principally of volcanic origin; with the exception of very small marshy districts, near the shore, they are dry, more or less sterile, but rich in solfataras and gaseous emanations; with respect to the greater portion of these fever localities the paludal origin of malaria appears, at all events, very doubtful.

(5) The same remarks may be applied to the hill fever in some districts of India, as in Mysore, a dry, rugged, mountainous and barren country, while in some other districts it seems to be connected with marshy soil. Finally, Dr. Hirsch alludes to the influence which *earthquakes*, according to the testimonies of Tschudi, A. Smith, Mammi, Trapani, and Epp, seem to have in causing an increase in the frequency and violence of malaria fevers.

In reviewing the various agencies influencing the occurrence and spread of malaria fever, the author remarks that observation and experiment have not yet taught us what are the products of organic decay causing malaria, or what is the action of the gaseous effluvia of volcanic soils, or of decomposing mineral detritus. His researches lead him to the inference that the different noxious conditions mentioned, exercise great influence on the spread of malaria fever, but do by no means sufficiently explain its origin, and its epidemic propagation. The facts (1) that some thoroughly marshy districts are exempt from malaria fever; (2) that in malarious regions there are occasionally fluctuations in the occurrence of the fever which are opposed to our notions of the influence of meteorological conditions; and (3) that sometimes epidemics of malaria fever spread over whole countries and groups of countries, which are usually free from such diseases, render it still more probable that in the origination of malaria fevers there are causes at work which are wholly unknown to us.

The *yellow fever* is the second disease treated on by Dr. Hirsch.

The oldest medical history of yellow fever is very incomplete. According to the communications of Herrera it existed as an endemic disease in the West Indian islands at the time of the first landing of the Spaniards; the reports of Rochefort, Dutertre, and some others are to the same effect, but the circumstances, mentioned by some authorities, that the disease attacked principally the natives, that it raged in North America during the winter, that the epidemic invaded the wigwams of the natives, while the yellow fever is a disease of populous towns, these circumstances, coupled with the fact that in many places, at all events, the yellow fever did not appear until after the settlement of foreigners, render it in Dr. Hirsch's opinion most probable, that the fevers found endemic amongst the natives, at the time of the discovery of America, were not the true yellow fever, but remittent or typhoid fevers, and that the immigration of a foreign nation from a temperate climate, and the changes in the social conditions, connected with this immigration, are essential points in the genesis of the true yellow fever. The yellow fever of the present day would therefore, according to this theory, be a product of the immigration of Europeans into America.

The West Indian Islands, the Coasts of Mexico, New Granada, and Columbia have been from the beginning the seat of the greatest prevalence of the disease. The most complete reports, however, which we possess on the epidemics of yellow fever relate to North America; through these the author has been enabled to construct two valuable tables on the geographical distribution, and on the chronological appearance of yellow fever in North America. The South American continent had been up to the commencement of the present century much less invaded by yellow fever. The disease was, according to Chisholm, first introduced into Guyana from the West Indies in 1793; it appeared for the second time in 1800, but was not again observed until 1837, when it was imported from Barbadoes. The Brazils remained free until 1849, when, a ship coming from New Orleans, and the Havannah, brought the fever to Bahia, whence it passed on to Rio and Pernambuco, and later to Para, and southwards as far as Santa Catharina, spreading also inland along the banks of the river.

The west coast of South America remained even longer exempt than the east coast. Dr. Hirsch considers it doubtful whether the epidemic described by Ulloa as having raged at Guayaquil after the arrival of a Spanish ship was really the yellow fever; but he considers it as certain that it appeared there in 1842, introduced probably from New Orleans, with-

out, however, spreading southwards to the ports of Peru, although these were, according to A. Smith, in lively intercourse with Guayaquil. In 1852 emigrants from the Brazils imported it into Lima, whence it spread southwards, and reached Chili, especially Valparaiso and St Jago in 1856.

The eastern hemisphere has been much less visited than the western; the first certain account, by Navarrette, relates to 1730 and 1731, when the disease was brought by an American ship to Cadiz; it again broke out, according to Roxana, in Malaga in 1741, and in the same century twice more at Cadiz; but the first more-widely spread epidemic occurred between 1800 and 1804, having originated at Cadiz in 1800, imported by a ship from Charleston. During that epidemic it spread not only along the coast of Spain, but also inland to Seville, Cordova, Granada, and other towns. Between 1804 and 1810 Spain seems to have been free from yellow fever; later there have been several outbreaks; but not so widely spread. Out of Spain Dr. Hirsch notes the appearance of the yellow fever to any extent only in three places in Europe, viz., Lisbon (1733 and 1857), Leghorn (1804), and Palma, on the island of Majorca; in addition to which, he mentions the occurrence of isolated cases in various ports, as, for instance, at Southampton in 1852, and at Brest in 1856.

The west coast of Africa has been likewise visited by the yellow fever. Hirsch mentions Senegambia and especially Sierra Leone, where it has repeatedly raged since 1816, and whence it was carried to the island of Ascension in 1823, and to Boa Vista, as shown by the report of the late Dr. McWilliam. The Canary Islands, too, were invaded by the disease in 1810 through ships from Cadiz.

The geographical limits of epidemics of yellow fever have hitherto been Portsmouth in New Hampshire, latitude 43° 5′ north; and Buenos Ayres, latitude 35° south. Within these limits the disease is endemic only in the West Indian Islands, the coasts of the Gulf of Mexico as far as the mouth of the Orinoco, and the coast of the Atlantic as far as Charleston, and on the eastern hemisphere on the west coast of Africa (Senegambia and Sierra Leone); the other places previously mentioned have only been visited by epidemics which in general were local, and exhibited a tendency to the pandemic character only between 1796 and 1797, in 1839, and in 1853.

Among the points influencing in a prominent manner the occurrence and propagation of the yellow fever, the author considers especially the influence of *acclimatization*, *race*, and *nationality*.

With regard to *acclimatization*, he maintains: (1) That the susceptibility of individuals, not yet acclimatized, is in proportion to the degree of the geographical latitude under which they had previously lived, or to the temperature of their former residence; (2) That the susceptibility of immigrants or strangers decreases in proportion to the prolongation of their sojourn in the yellow-fever districts; (3) That neither the residence in the tropics, nor that near the fever districts suffices to remove the susceptibility, although immigrants from hot climates are, as just mentioned, less susceptible than those coming from cold regions; (4) That even several years residence in a fever district does not effect acclimatization—that this is established only by the immigrants having resided in a place during a severe epidemic; (5) That this immunity is lost by several years residence in colder latitudes, or in localities exempt from yellow fever, or even by the absence of the yellow fever from the place of residence during a long period; (6) That, however, even perfect acclimatization does not procure absolute immunity, as in severe epidemics even Creoles are occasionally attacked by the disease; (7) That, finally, the immunity acquired by acclimatization is greatest for that locality, in which the individual has been acclimatized, and that it is often lost by change of residence even to a not more unhealthy place.

These remarks on acclimatization relate, however, merely to places where there is an endemic prevalence of yellow fever.

The peculiar immunity of the *negro race* seems to be in some way allied to the influence of acclimatization, as a protracted residence of the negroes in colder countries renders them comparatively more liable to be attacked by the disease; but even then their predisposition is much less than that of the white population. This resistance extends, in a certain degree, to the mulattoes; and this degree seems to be in proportion to the amount of dark blood combined with the white. The author is therefore inclined to think that there is something peculiar in the negro constitution which effects this protection against the yellow fever.

Among the *meteorological* influences that of the *seasons* seems, according to Dr. Hirsch's tables, to be not quite so distinct as it has been remarked by some observers to be. Thus, we find that in the tropical regions some epidemics have commenced in every month of the year: in the southern States of North America by far the majority commence between July and September; in New York and the middle States, August is the principal month for the beginning of epidemics.

Of great influence seems to be *the temperature*, as yellow fever epidemics have never commenced below a certain elevation of temperature, and have always ceased when the temperature sank below a certain degree. Dr. Hirsch adopts, with slight restrictions, the remark that the minimum temperature for the commencement of yellow fever lies between 72° and 80° F., which is the average winter-temperature of the West Indies. The isothere of 72° F. would therefore mark the northern limit for the yellow fever. It must, however, be understood that this limit relates only to the *origin* of epidemics, while an epidemic once originated may continue at a much lower temperature, but is always cut short by a real frost. The author does by no means adopt the theory that the high temperature is the principal cause of the yellow fever, although a certain degree of heat favours its development; he, on the other hand, inclines to the view that the highest degree of temperature is unfavourable to its development, and that this is perhaps the cause of the exemption of the hottest part of the west coast of Africa.

The high degree of *atmospheric moisture* existing in the tropics which has been repeatedly adduced as one of the most important elements in the genesis of yellow fever appears to our author to be of secondary influence. The influence of atmospheric pressure and electricity is, as yet, altogether unknown. The influence of the wind, too, is as yet not sufficiently studied; the view that it is the bearer of the yellow fever matter seems untenable. The purifying action of high winds and storms is likewise not so certain as it has been considered by several observers to be, as important exceptions have been noted.

Among the geological conditions, a certain *elevation* above the level of the sea has been considered by some as a bar against the spread of the yellow fever; Dr. Hirsch, however, shows that although the principal home of the disease is in plains situated on the coasts of the sea and of large rivers, yet it is impossible to fix the degree of elevation beyond which it cannot ascend. He refutes also the opinion that *marshiness of the soil* is one of the essential elements in the production of the disease, as several towns on marshy soil, within the yellow fever districts, have been but rarely visited by the disease, while other places situated on dry ground have been frequently and violently invaded by it. The theory of the positive influence of *infiltration of the soil* with *moisture* on the genesis of the yellow fever is likewise denied.

The author then considers the fact that yellow fever is a

disease which is almost entirely confined to *densely populated* towns, or to those districts of towns which contain the crowded and ill-ventilated dwellings of the poor, while it scarcely ever spreads in rural habitations; and he examines, in connexion with this fact, the theory almost entirely founded on it, that yellow fever is caused by the *social conditions* prevailing in fever localities, viz., by the crowding of a comparatively large number of individuals in a limited space, and by the presence of a considerable quantity of organic substance (food and waste material) decaying under the influence of heat conditions which occur in the quarters of the poor in many of the seaports of tropical and subtropical regions, and also in many ships. On the other side, Hirsch mentions the facts that epidemics of yellow fever have repeatedly occurred in places which were exempt from the hygienic disadvantages mentioned, and that places abounding in these defects, situated in the tropical and subtropical regions, remained for centuries free from the disease until it was imported from without. The author, therefore, after carefully weighing the evidence, decides against the *putrefaction theory, i. e.*, he denies that the impurity of the air and water caused by putrefaction of organic substances is by itself sufficient to explain the origin of yellow fever, although he acknowledges that the hygienic defects mentioned exercise very great influence on the spreading of the disease.

Finally, Dr. Hirsch alludes to the view entertained by some authors that there are *several species* of yellow fever; he sees, however, no foundation whatever for such an assertion, as the epidemics of yellow fever in the different countries have shown a remarkable analogy with regard to pathognomonic symptoms and mortality. He suggests that the occasional confusion between the bilious remittent fever and the yellow fever may have occasioned the view of the plurality of the latter. Historico-geographical researches do, on the contrary, by no means support the view of the identity of the bilious remittent and the yellow fever.

The remarks on malaria fevers and yellow fever have taken up so much space, that I am compelled to restrict myself with regard to the other portions of the work to very few observations.

III. The *Indian* or *Asiatic cholera* (pp. 111 to 148) is considered by our author as specifically different from the sporadic disease called *cholera nostras* (English cholera), which has been described by Hippocrates, and the symptoms of which offer a remarkable analogy to those of the Indian cholera.

Dr. Hirsch discusses the original seat of the disease, the spread of the different epidemics, the countries which have been visited and which have been spared, the influence of race, nationality, seasons, and meteorological conditions in general, as also that of elevation, nature of the soil, and other geological relations.

IV. Under the head of *typhous fevers* or *typhus* (pp. 149 to 192) Hirsch treats of five varieties, as being so intimately allied to each other as to warrant their being considered as one group.

1. Simple typhus (typhus exanthematicus, typhus petechialis, Fleckfieber or spotted fever, or "typhus").

2. Typhoid fever (typhus abdominalis).

Both these varieties of fever seem to be spread over the whole surface of the globe.

3. *Typhus syncopalis* is the "sinking typhus" described by Thomas Miner (typhus syncopalis, sinking typhus, or the spotted fever of New England, Middletown, 1825), and seems to be a variety of real typhus, characterized by violent frontal headache, vertigo, loss of sight, epileptiform and apoplectiform fits, loss of power in the limbs simulating paralysis, peculiar sense of constriction in the precordial regions, accompanied by extreme dyspnœa. The want of any description of the post-mortem appearances leaves, as Hirsch remarks, unfortunately some doubt as to the real nature of this affection, the occurrence of which in Massachusetts had been described by Strong in 1806. No reports exist of this form of typhus after 1827.

4. *Typhus recurrens* or *relapsing fever* is a variety which seems to have occurred not only in the United Kingdom, but, according to Dümmler and von Bärensprung, also in Silesia in 1847, contemporaneously with the hunger typhus, and is, according to Engel (*Oester. Medic. Jahrb.* 1846, iii, 249), endemic in the Bukowine, a district in the north-west part of Moldavia. Griesinger has observed the disease, together with the exanthematic typhus and the typhoid, in Egypt, and Dubois, in 1847, in New York, as imported by the Irish simultaneously with typhus.

5. *Typhus icteroides* or *biliosus* (*das biliöse typhoid*).

This variety has been ably described by Griesinger as occurring, together with other varieties of typhous fevers, in Egypt, the eastern coasts of the Mediterranean, the Ionian and other islands (*Archiv für physiol. Heilkunde*, xii, p. 29, and Virchow's *Handbuch der Pathologie und Therapie*, vol. ii, p. 210: Erlangen, 1857). Dr. Hirsch considers this form as a disease frequently confused with bilious remittent fever,

and as identical with Burnett's *Mediterranean Fever* ("A Practical Account of the Mediterranean Fever: London, 1816"). Griesinger regards typhus biliosus as nearly allied to relapsing fever, and Graves, Hokes, and O'Brien describe it as occurring simultaneously with exanthematic typhus and the relapsing fever in Dublin in 1826. In Russia, Germany, and Switzerland, too, epidemics of this variety have been observed.

The author discusses various climatic and social influences acting on the development and spread of the various varieties of typhus fevers, and inclines to the view of the plurality of fever poisons, *i. e.* that the different forms of fever are connected with different specific poisons.

v. The *Plague* ("Die *Beulen pest*") pp. 192 to 214.

I must pass over this most interesting chapter in the history of epidemic diseases, and can only mention that the author establishes two varieties: (1) The Oriental or Levantine, and (2) The *Indian plague*, the principal difference between them being in the fact, that the Indian plague is frequently accompanied within the first days by a very acute and often fatal form of pleuropneumonia, which disease is very rare in the Levantine plague. Hirsch is of opinion that the "black death" of the Middle Ages, which was frequently accompanied by acute pulmonic disease, killing within the first days, was the "Indian plague."

The other diseases treated in the division of acute infectious diseases, are:

VI. *Small-pox* (pp. 214 to 224).
VII. *Measles* (pp. 225 to 234).
VIII. *Scarlet fever* (pp. 235 to 242).
IX. *Erysipelas* (pp. 242 to 255).
X. *Febris miliaris*—Suette miliaire, Schweissfriesel, pp. 256 to 272).
XI. *Dengue* (pp. 272 to 276).
XII. *Influenza* (pp. 277 to 300).

The second division of the first volume is occupied by *chronic constitutional diseases*, under which head the author treats of:

I. *Leprosy* (pp. 301 to 335).
II. *Syphilis* (pp. 335 to 378).
III. *Frambœsia*—Pians, Yaws, Bubas, Gatto, Dlhoke (pp. 379 to 388).
IV. *Button Scurvy* (pp. 389 to 390).
V. *Veruga* (pp. 390 to pp. 394).
VI. *Goître and Cretinism* (pp. 394 to pp. 456).
VII. *Ergotism* (pp. 456 to 467).

VIII. *Acrodynie* (pp. 468 to 472).
IX. *Pellagra* or mal rosso, mal del sole, mal del Padrone, cattivo male, male della vipera, mal de la Rosa, etc. (pp. 472 to 491).
X. *Burning of the Feet* (pp. 491 to 493).
XI. *Scrofula* (pp. 494 to 521).
XII. *Scurvy* (pp. 521 to 552).
XIII. *Chlorosis* (pp. 533 to 557).
XIV. *Geophagia* or Dirt-eating, mal d'estomac, cachexia Africana, Anæmie or hypoæmie intertropicale, malaria-chlorosis (pp. 558 to 568).
XV. *Diabetes* (pp. 568 to 572).
XVI. *Gout* (pp. 572 to 583).
XVII. *Rheumatism* (pp. 583 to 598).
XVIII. *Beriberi* (pp. 599 to 612),

The second volume of Dr. Hirsch's work treats on the diseases of the different organs. The first portion of this volume contains:

I. Diseases of the respiratory organs (pp. 1 to 156).
  A. Pulmonary Catarrh and Bronchitis, Summer Catarrh, and Nakra.
  B. Pneumonia and Pleuritis, Typhoid Pleuropneumonia, Malaria-pneumonia, Melanosis of the Lungs, Grinders and Miners' Consumption, etc.
  C. Pulmonary Phthisis (tuberculosis).
  D. Whooping Cough.
  E. Croup and Diphtheria.
II. Diseases of the Chylopoietic System (pp. 157 to 326).
  Diseases of the Mouth.
  A. Stomatitis Erythematosa Vesicularis, Stomatitis Intertropica, Stomatitis Materna.
  B. Stomatitis Ulcerosa.
  C. Noma.
  D. Parotitis Polymorpha (mumps).
  Diseases of the Stomach.
  Diseases of the Intestinal Canal.
  A. Dysentery.
    Bicho or Biecho.
  B. Cholera Nostras and Cholera Infantum.
  C. Endemic Colic (colic of Poitou, of Madrid, of Devonshire, colica intertropica, vegetabilis, colique sèche, dry belly-ache, etc.)
  D. Milk Sickness (swamp sickness, sick stomach).
  E. Intestinal Entozoa.
    Diseases of the Liver.
    Diseases of the Spleen.

The second portion of the second volume, completing the whole work, will, it may be stated, probably be published by the end of the present or the beginning of the next year.

I am sorry to have been obliged to confine my report to a mere mentioning of the greater portion of the contents, but my notes on the malaria fevers and the yellow fever will, I hope, give to the Society an idea of the manner in which Dr. Hirsch has treated the subject. These notes, however, can by no means impart an adequate conception of the great industry with which the author has studied the records of every disease, and especially of the zeal with which he has endeavoured to obtain the numerous essays scattered through the journals of different countries, the official reports of the army and navy of Great Britain, of the Colonies, of the United States, of France and Holland, of all the countries on which reports exist in medical literature.

The task which the author has undertaken in compiling all the trustworthy knowledge which we possess, on the historico-geographical relations of the various diseases into condensed essays, was a very onerous one; he has fulfilled this task in the most praiseworthy manner. He has, through this, laid a basis for the further study of epidemic diseases from the historical and geographical point of view, a study, which may not only throw light on many as yet obscure features in the nature of these diseases, but may and must also teach us the way of gradually lessening the violence and ultimately even preventing the outbreaks of epidemics. As the motto of our Society is "venienti occurrite morbo," we, before most others, must hail the appearance of Dr. Hirsch's work as a successful effort in the right direction, and we may be proud to see, that the author has dedicated his work to "The London Epidemiological Society."

Those who make themselves acquainted with the work before us, will find that English literature has been studied by the author, with particular care; they will also come to the conclusion that for England the publication of such a work is of especial value, as the medical men of England attached to the army and navy of this country, or employed in the English colonies have greater opportunities for studying the historico-geographical relations of epidemic diseases than those of any other country.

It would, therefore, be very desirable that Dr. Hirsch's *Handbook of Historico-Geographical Pathology* should be translated, and this translation would form a highly important addition to the medical literature of this country.

REPORT ON EPIDEMICS, 1861-2.

Part I.

Geography of certain Epidemics Abroad in 1861-2.

By GAVIN MILROY, M.D., F.R.C.P.

(*Read November 3rd*, 1862.)

[The following memoranda have been derived almost exclusively from passing notices in the domestic, literary and professional journals of the day. The sketch is consequently very imperfect, and makes no pretention to anything like an accurate record of the geographical distribution of the diseases mentioned. Additional materials would doubtless have been found, had the numerous medical periodicals of the continent been regularly examined; and, on future occasions, this defect should be sought to be supplied. But even among our more laborious brethren in Germany and elsewhere, the object we aspire to has not attracted the attention it deserves. No systematic attempt has yet been made, as far as we know, to gather together from all available sources, and to arrange the authentic notices of any one epidemic disease, during the year, in different countries and regions of the world. It is a work that well deserves the consideration of this Society, more especially as no other nation possesses such ample and varied sources of information from all parts of the world as our own, provided only means be taken to procure it through the different official channels.]

I. CHOLERA.

In the last Annual Report, it was mentioned that the disease had been prevailing during the summer months of 1861 with great severity in many districts of the north-western provinces of India, which had suffered so terribly from the famine in the early part of the year. In Agra, Delhi, Meerut, etc., it was very fatal; and some of our European regiments experienced heavy losses. Between five and six hundred white troops are said to have been cut off. In some cantonments, there was quite a panic among the soldiers on the first appearance of the pestilence—a result which invariably serves to increase the predisposition to the disease, as well as to aggravate its fatality. Prompt measures were adopted by

the military authorities to arrest the progress of the scourge wherever it manifested itself. A general order was issued by the commander-in-chief, Sir Hugh Rose, directing the immediate removal of the troops from their cantonments, and their encampment on some healthy spot in the neighbourhood. Should the disease follow them, the camps were to be shifted every second or third day to short distances, and always at right angles, when possible, to the direction of the wind. The troops were ordered not to return to their cantonments until all traces of the disease had disappeared from their neighbourhood, and the barracks and hospitals had been fumigated and whitewashed. Along with these measures, the men were to have tea and coffee served out before their going out in the early morning; they were to be provided also with flannel belts, and every precaution was to be taken against their remaining in wet or damp clothes. No mention was made in the order respecting the quality of the water supplied to the troops; but there is reason to believe that this important point was not overlooked by the medical officers. At the same time, it was raging at Canbul, Candahar, and other regions to the west of the Indus; and it also continued to prevail in various parts of Persia, as at Bussorah at the head of the Persian Gulf, and in the pachalic of Bagdad, along the course of the river Tigris. In the early part of the year (1861), the city of Teheran and other places in the north of Persia had suffered. Towards the end of the year, it broke out in Bombay, and occasioned considerable mortality in the Hindoo bazaar of the town. During the summer months of the present year, it has been prevailing in several parts of this Presidency, more especially in the malarious province of Guzerat. Hyderabad, Secunderabad, and other places about the middle of the Deccan, and nearly intermediate between Bombay and Madras, seem to have been affected at the same time. Nor was the region in the extreme north-west of the peninsula exempt from the pestilence at this season; Peshawar, Kobat, etc., having again been the seat of a severe visitation. The French forces in Cochin China also suffered severely during the summer.

In the island of Mauritius the disease, which had much subsided in the early part of the year, increased considerably during the summer months. The repeated visitations of the cholera during the last eight years in this island of the Indian Ocean, in the twentieth parallel of south latitude, are worthy of notice; seeing that after 1819, the date of the first appearance of the disease, there was no recurrence of it till

1853, notwithstanding the greatly increased communication with India, and the frequent occurrence of cases in vessels during their voyage therefrom.

Some journals have stated that the cholera had appeared at Adelaide, the capital of South Australia, and that the inhabitants of New Zealand had been apprehensive of the introduction of the pestilence by the frequent communication between the two colonies; but no authentic confirmation of this report has, as far as we know, been received.

Recent accounts from India represent that the cholera continues to prevail in different parts of the upper provinces, and that the town and cantonments of Peshawur were still suffering severely.

Various points on, or near, the coast of China have been the seat of severe visitations of the disease during the present year. At Shanghai and at Pekin the loss of life has been very large. It would seem that the northern provinces have been more afflicted than the southern parts of the empire. In consequence of the severity of the disease at Shanghai, the government of Hong Kong had adopted special precautions in respect of arrivals from that port. Japan, also, has not escaped; the latest accounts represent that the deaths at Nagasaka and other towns have been very numerous.

During last summer, a fatal outbreak of the pestilence is said by some journals to have occurred at Jaffa, on the coast of Syria; other journals mention Jeddah on the Red Sea as the seat of the outbreak. We have not heard of its existence in other parts of that region; but it may be worth noting that, in the later months of last year, there was in Beyrout an unusual amount of low typhoid fever, which was accompanied with violent vomiting and purging in many instances, leaving the patients exhausted, and the recovery very tedious. It was dreaded at the time as heralding the approach of one of those scourges that are apt to befall countries whose harvests have failed, either from natural causes, or from the devastations of war, as had recently occurred in different districts of Syria. It may be also mentioned that, during the present summer, it was currently reported in Malta that an infectious disease was very prevalent in different parts of Egypt and Arabia, and that many of the Hadgi or Moslem pilgrims had died from it on their passage from Alexandria to the coast of Barbary. Suspicions were entertained by many persons that the disease was cholera; but no exact information seems to have been made public. The vessels with the pilgrims appear to have been

admitted to pratique at Malta, but afterwards to have been kept in quarantine for three days at Tunis, before communication with the shore was permitted.

The only places in the New World, of which we have seen any notice as to their being affected with the cholera, are the port of Pernambuco, and also the province of Ceara in Brazil. Both notices appeared in the public journals as having issued from the Lisbon Board of Health. Beyond this simple announcement, unfortunately, nothing further can be said respecting the statements in question, whether they are to be credited or not.

I am not aware that the disease in an epidemic form has been observed in any part of Europe.

II.—YELLOW FEVER.

During the last twelve months, this malignant fever has not ceased to prove the cause of great sickness and mortality in different parts of the Carribean gulf, and the adjacent shores of the American continent. The expeditionary forces sent by France, Spain, and this country to Mexico at the beginning of the present year, have all suffered more or less severely from the scourge while they remained at or near Vera Cruz, which has always been one of the most sickly spots in that region of the world. The town stands on the seaboard of a flat, uncultivated, and partly swampy plain, extending inland to the foot of the rising ground which stretches away in a continued ascent to the high plateau on which the city of Mexico is situated, at an elevation of several thousand feet. The sanitary condition of Vera Cruz, as all who have visited it will remember, is much neglected. In the middle of the streets are open gutters or sewers, for the reception of all kinds of offal; the carrion crows are the principal scavengers. The first detachment of the small British force of marines, about seven hundred in number, was landed in the third week of January, and the rest quickly followed. Part of the force was barracked in a large building in the town, previously used as an almshouse, and part was encamped out about nine miles distant. Soon after their arrival, the troops began to suffer from diarrhœa; and this was followed by dysentery and low typhoid fever, which ere long lapsed into, or gave way to, genuine yellow fever. A very large proportion of the attacks proved fatal. The men under canvas are said to have been more sickly than those lodged in the town. At one time, nearly a third of the entire force were on the sick list. In consequence of this state of things, most of the men were re-embarked

within seven or eight weeks of their landing; only one hundred and forty volunteers remaining on shore, as the British portion of the garrison of Vera Cruz. In the course of the next four or five weeks, twenty of these volunteers had died from the fever. As the disease was now (the middle of April) very prevalent in the town, with every prospect of increasing malignity for the next five or six months, the remainder were sent off without further delay to Bermuda, with the exception of seven left in the Mexican hospital at Vera Cruz, of whom three were dangerously ill at the time. The total number of deaths in the battalion of marines up to the 3rd of May amounted to fifty, being at the rate of fourteen per cent. of the strength, in the course of a two-months' residence at Vera Cruz at what is considered the healthy season. It was remarked that the "vomito" set in unusually early this year.

The French force, which numbered about 3,000, I believe, sustained very heavy losses from disease while they remained at Vera Cruz, and in the low grounds near the coast; but the particulars, as far as we know, have not yet been made public. Many of the principal medical officers fell victims to the yellow fever. Whether it continued to follow the troops up to Orizaba, which is about eighty miles inland and at a considerable elevation, we are not aware. Hitherto, this place has been considered to be above the yellow fever range; but recent experience has shewn that this form of pestilence will manifest itself at higher altitudes above the sea level, and in cooler climates, than has generally been alleged. The disease, which seems to have been the chief cause of the large amount of sickness among the French troops at Orizaba, was dysentery, one of the most prevalent and unmanageable of all maladies to an army in the field. The latest accounts (October) represent yellow fever as still at Vera Cruz, and that several of the French ships of war off the port were suffering from it.

The Spanish force, while it continued at Vera Cruz and the neighbourhood, is believed to have suffered from fever and other sickness even more severely than the French; but no authentic particulars are known.

Besides the Mexican coast, the chief seats of yellow fever in that region appear, as far as we can judge from the scanty information at command, to have been, during the present year, the great port of Havanna in the Island of Cuba, and one or two places, especially Nassau, in the adjacent group of the Bahama islands, lying between Cuba and the extreme

southern point of Florida. Several of our ships of war, as well as of our merchant vessels, seem to have become infected with the fever at Nassau.* The mortality among European shipping from this cause at Havanna has been stated, in the public journals, to have been very great this season. The island of St. Thomas, the great entrepôt of our West India mail steamers, seems to have been tolerably healthy this year. Recent accounts from Barbadoes state that several deaths from yellow fever have occurred there. Wilmington, in the south part of North Carolina, was also the seat of the disease. Besides these places, we gather, from the notices of the Portuguese and other Boards of Health, that the chief ports of Brazil, as Rio Janeiro, Bahia, Pernambuco, and Maranham, continued to be infected, at different times throughout the present year, with the disease; and, therefore, that arrivals therefrom were liable to the appointed detention, whether any sickness had occurred on board during the voyage or not, conformably to the Quarantine Code of Portugal.

It may be here mentioned that the elaborate paper on the Epidemics of Yellow Fever in Peru, from 1853 to 1857, by Dr. Archibald Smith, long resident in that country, read before this Society last December, has attracted much attention in that country. The editor of the Medical Journal in Lima, Dr. Ulloa, considers the statements of Dr. Smith of the highest value, and expresses a hope that our Society may encourage the prosecution of further enquiries, to determine the identity, or otherwise, of the fevers prevailing on the two sides of the great Cordillera range of mountains.

Leaving now the New World, it deserves notice that, during the early part of the present year, that part of the west African coast in the Bight of Biafra, in latitude of between four or five degrees north, and including the mouths of the rivers Bonny and Calabar, was the seat of the worst visitation that had been known there for the previous six-and-thirty years. Out of a population of one hundred and forty whites, no fewer than seventy-five died within a month. The master, mate, and several seamen of one vessel at New Calabar were cut off in the course of two or three days.† Among

* The *Petrel* had lost her surgeon, assistant-surgeon, two assistant-engineers, and eleven men. The *Melpomene* had arrived (at Halifax) on the 21st of Sept. from Nassau, with yellow fever on board, by which she had already lost nine men; and, two days after, the *Spiteful* arrived there suffering from the same cause, and which had proved fatal to eight of her crew. *Times*, Oct. 6.

† Major Burton, our consul at Fernando Po, in a letter to the *Times*, 31st Dec., 1862, writes: "H.M.S. *Prometheus*, stationed off Lagos, lost by death

the natives, too, there had been great mortality. It is to be remembered that this, and the immediately adjacent part of the African coast in the Bight of Benin, and stretching westwards to Cape Coast Castle, has been very rarely the seat of yellow fever, as compared with the districts of Sierra Leone and the Gambia, several degrees to the northward. Mr. Clarke, in that highly instructive paper on the Topography and Diseases of the Gold Coast, which is published in Part I. of the Transactions of this Society, states that it is wholly unknown there. The climate is represented by him as being much drier, and altogether less malarial, than that of Sierra Leone and the Gambia.

Presuming that the quarantine notices issued by the Boards of Health at Lisbon and Trieste are based on reliable information, it would seem that yellow fever has, during the last twelve months, existed in other points of the African coast, both to the north and the south of the Calabar—as in the Cape de Verde islands in latitude fifteen degrees, immediately to the north of the Gambia, and in Prince's and St. Thomas's islands, within a degree or two of the equator, and south of Fernando Po. The Portuguese settlement of Loando, eight or nine degrees south of the line, appears also to have been the seat of the disease in the early part of the present year, as well as in 1861.

If these statements be correct, we see how very imperfect our means, even in the case of official documents, are of obtaining accurate information on the geographical diffusion of many epidemic diseases; for in the recent Report on the Health of the Navy, it is stated that—

"Although yellow fever has appeared at distant and uncertain periods at Sierra Leone, it has never been known to break out spontaneously on any other part of the coast, unless, perhaps, at the island of Bulam; nor has it ever appeared at any of the European settlements to the southward, with the exception of Fernando Po, to which it was carried in 1829, by H.M. ships *Eden* and *Champion*, nor in any of the cruisers while touching at these settlements for, at least, the last forty years. It is a mistake to suppose that this fatal disease is common to the entire sea-board of Western Africa;

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and invaliding, 84 out of 100 whites. In the Bonny river, it is calculated that, out of 280, some 134 died in seventy eight days. One ship, the *Osprey*, lost all her crew of seventeen men, except the master. The disease was yellow fever, which still continues in the New Calabar river; while, in the Bonny, it has been succeeded by a no less deadly typhus. At Fernando Po, 76 men died in two months, out of a total of 231 whites."

for, although it has several times been introduced into the settlement on the Gambia, and into Senegal and Goree, there is no record of its ever having been seen on the grain, ivory, or gold coasts in the regions of Benin or Biafra, or on any part of the main land southward up to the Congo."

In connexion with the subject of yellow fever, when it occurs among shipping, whether of the navy or of the merchant service, the attention of the profession has been of late years directed, in an especial manner, to the primary importance of a more thorough ventilation of the between-decks, and particularly of the berths of the crew, who have hitherto been, and still are, far too much crowded together at night. The valuable papers on the fatal prevalence of the fever in several of our ships of war of the West India squadron, which have been communicated to the Society during the last two sessions, have shewn in a strong manner the necessity of this subject being examined into by a committee of experienced medical officers of the navy, for the instruction and guidance of the Admiralty. The committee that was appointed by the Admiralty last year to inquire and report on the best means of improving the ventilation of ships, and which, it is understood, have sent in their report, consisted entirely of executive officers of the navy, no reference having been made to the medical department of the service in connection with the inquiry. It may, therefore, be presumed that the inquiry was limited exclusively to the engine rooms and the holds of steamers, and that the still more important matter of the berths of the crew at night has not yet been taken in hand. Within the last month or two, a trial was made at Portsmouth of a ventilation apparatus of Mr. Phipson, C.E., on board the *St. Vincent*—the condition of the atmosphere in the lower decks at night having been found to be prejudicial to the health of the five or six hundred youths who live on board. It is to be hoped that the subject will not be allowed to drop until a thorough inquiry, by competent persons, has been instituted, in all its bearings, on the health of our seamen in general, whether in the royal or in the mercantile marine, and on the causes of the exceeding sickness of some ships over others on the same station, and while engaged on similar duties and exposed to the same atmospheric and climatic influences.

Before quitting the present subject, it will be convenient here briefly to notice one or two recent matters arising out of it, in connection with the practice of Quarantine in this country, and in our colonies. And first, as to the island of

Bermuda, which, being intermediate between the West Indies and British North America, is usually touched at by vessels in a sickly state, obliged to leave the tropics on their voyage to the salubrious climate of Halifax. It would appear that the transports, which conveyed our troops from Vera Cruz on account of the sickness they had encountered, were detained in seclusion there for three days after their arrival, before they were permitted to be landed. The case deserves notice, in consequence of the rigorous measures adopted of recent years by the authorities of Bermuda towards ships of war, and other vessels, arriving from the Gulf of Mexico with sickness on board. Two years ago, H.M.S. *Barracouta* arrived there from Jamaica; some cases of yellow fever had occurred during the passage. The civil authorities, dreading the introduction of the fever, although it has repeatedly prevailed in the island, would not permit any communication with the shore, nor any of the sick to be landed. The result was that, while making for Halifax, the *Barracouta* (which was much overcrowded at the time from having a large number of supernumeraries from Jamaica on board) encountered a violent gale, which compelled her to steer for England, which she did not reach till twenty days after leaving Bermuda. Twenty cases of fever had occurred on board, and six of them had proved fatal.

The other case, deserving notice under this head, occurred only three months ago in the Thames. The ship *Melita* arrived from Nassau on the 23rd of August, after a voyage of about twenty days. Eight deaths had occurred on the passage, most of them from what seems to have been yellow fever. The captain, with two passengers, had landed at Dover, and the vessel steamed up the river without acquainting the Custom-house authorities with the particulars. A short segregation was imposed, and no ill results followed.

The only other circumstance connected with quarantine, which we shall mention, is a recent notice issued from the Board of Health of Surinam in Dutch Guiana, in respect of the West India Dutch island of Curaçoa, where small-pox had broken out, and imposing a strict and lengthened quarantine upon all arrivals therefrom. Even when no cases of sickness had occurred during the passage, and the crew were healthy at the time of arrival, no vessel was to be admitted to free pratique until forty days had elapsed since her leaving Curaçoa. In this, as in similar instances elsewhere, no allusion is ever made to the adoption of the surest precaution of all against small-pox, viz., *Vaccination*.

III.—TYPHUS, ERUPTIVE AND ENTERIC.

In a recent number of the *Edinburgh Medical Journal*, there is a most instructive account of a fatal epidemic of typhus and typhoid fevers in Iceland during the last four or five years by Dr. Hjaltelin, the island inspecting officer of health.* It commenced during the winter of 1857 in the northern districts, and gradually spread in different directions over almost every part of the island. During the summer months of 1858 the disease abated a good deal; but in the autumn, and still more in the winter of 1858-59, it much increased both in frequency and severity; and it continued to prevail, with varying intensity according to the season of the year, throughout 1859 and 1860. In the beginning of the latter year, 1860, the fever was very often associated with a bad form of dysentery; and about the same time, a good many sporadic cases of *malignant cholera* occurred. During the winter of 1860-61, the fever, although less frequent than it had been, was of as bad a type as ever, and proved very fatal in many districts, especially in the eastern part of the island, where nearly a tenth part of the population perished. In some places, one in every six of the inhabitants was cut off.† The deaths were occasionally one to three of the attacked.

In the spring of 1861, cases of malignant cholera were more frequent than those of fever; but the former disease never spread to any extent, and was limited to some fishermen's huts.

As to the exciting or favouring causes of this persistent and severe epidemic, the following facts are stated:—In the years 1856 and 1857, an epizoot prevailed extensively among sheep. Some—and Dr. Hjaltelin was of the number—considered that the disease was the common sheep-scab, and that it resulted mainly from the close packing of the poor animals in the winter, when generally little more than two square feet are allowed to each; while others believed that it had been imported with some sheep from Scotland, and recommended that all the infected animals should be straightway slaughtered, as had been done on a former occasion in the course of last century. This opinion found favour with the go-

* This gentleman published at Rykiawik, in 1860, a small work on typhus in Iceland. There is perhaps no country in the world, he states, where the fever is more common.

† "Almost the same amount of mortality as happened here occurred during the last epidemic in the West-Manna Islands, off the coast of Iceland. Out of three hundred inhabitants, forty died. The physician of the place was one of the earliest victims."

verning authorities; and, accordingly, no fewer than two hundred thousand sheep—about a third of the whole number on the island—many of which were, however, quite sound, were killed in the autumn and winter of 1857-58, and the meat salted and laid up for use during the next twelve months in the small store-houses that are commonly attached to Icelandic farms. So convinced was Dr. Hjaltelin that the public health would eventually suffer from the continued use of this food, (which from being imperfectly cured often became decayed, and occasioned the most offensive effluvia in the confined and generally uncleanly abodes of the people), and also from the protracted deprivation of sheep-milk, butter, and cheese to which they are ordinarily accustomed, that he memorialized the Sanitary Board at Copenhagen on the subject. The government seems to have concurred in the doctor's views; but, unfortunately, the orders that were sent out in consequence arrived too late to be of any benefit. The mischievous effects were not long in manifesting themselves. "People coming from the country," says Dr. Hjaltelin, "where large stores of salt provisions existed, informed me that the odour of rotten meat was in many houses insupportable; they declared that they could not stay or sleep in them; and a short time afterwards, I heard that typhus and typhoid fever had broken out in several parishes of the north." During the winter, the peasants, many of them with the disease upon them, came down from the highland districts to the fishing places near Reykiawik, and spread the fever among the fishermen's huts, which are usually much overcrowded. When once a case occurred in the dwellings of the poor, most, if not all, of the inmates were pretty sure to be attacked; and strangers stopping but a short time in an infected house often sickened. The average amount of space in the single apartment—which serves for parlour, dining-room, and bed-room—to each inmate, in most of the cottages, does not exceed one hundred cubic feet.

The total mortality caused by the epidemic among the entire population of the island, which is set down at about ten thousand souls, is not given. The country districts suffered far more severely than the inhabitants of and around Reykawik, where the fever was of a much less malignant character; for, out of nine hundred cases that were treated by Dr. Hjaltelin himself, not above thirty terminated fatally. There is no medical assistance to be had in many parts of the island. As to the prevailing type of the fever, Dr. Hjaltelin considers that about one-third of the cases were typhoid or enteric, and the rest typhus or eruptive.

PART II.

The State of Epidemic, Epizootic, and Epiphytic Disease in Great Britain, in 1861-62.

By J. N. RADCLIFFE, M.R.C.S.

THE following Report refers to the twelve months ending November the 31st, 1862. In respect of epidemics, this Report is necessarily based on the different returns of the Registrars-General of England and Scotland, published during the period to which it relates. The information contained in these returns on outbreaks of epidemic disease, at the time of, or soon after, their occurrence, is very imperfect. No other source of information, however, exists, or if existing, is accessible. I propose to bring the different facts on epidemics together in one connected view. The history thus formed will fall far short of what a scientific annual record of epidemic diseases should be; but the first step towards a more perfect history must be the systematic collation of existing materials.

It is necessary to remark that, in the subsequent report, I have, as a rule, substituted the term *continued fever* for the word *typhus*, so commonly made use of in the reports of local registrars, unless there is other evidence that the disease referred to was *typhus* properly so-called. In the old nosological arrangement of the Registrar-General of England (still in use in Scotland, although rejected in this country), "typhus" is used as a synonym of continued fever. In the new nosological arrangement adopted here, consistently with more recent researches, the terms "typhus", "typhoid", and "relapsing" are made use of in place of the common designation of continued fever; but in the official instructions to medical men for the registration of deaths, *typhus* is still directed to be used as the generic term of continued fever. If "typhus", "typhoid", and "relapsing" fever are to be regarded etiologically and nosologically as distinct forms of disease, as Dr. Murchison and others cogently argue, and as would seem most probable, it is manifest that the use of the term "typhus" in the returns of the Registrars-General of England and Scotland, diminishes very greatly the scientific and practical value of the returns, and tends to no little confusion. The need for the discrimination of "typhus" from other forms of fever, and consequently the disuse of the term as a synonym of "con-

tinued fever" in the published returns of causes of death, is clearly shewn by the remarkable epidemic of the disease which has for several months prevailed, almost unnoticed, in London, and by the partial outbreaks in Lancashire. It may be a question for future discussion, whether the Society should not submit to the consideration of the Registrars-General of England and Scotland the need of substituting the term "continued fever" for "typhus" in the published returns of the Causes of Death.

But it is not to be forgotten that the etiological and nosological distinctions of the different forms of fever had not, until very recently, assumed that position in the scientific and practical teaching of medicine, which would induce so strict an attention to the diagnosis of the maladies as it is important to secure. Moreover, there has been a much felt want of a text-book which accurately represented recent researches into the nature and forms of continued fever. This want has now been happily supplied by the publication of Dr. Murchison's treatise on the *Continued Fevers of Great Britain*.* The publication of this work will constitute an epoch in the study of fever. What Louis' book effected for typhoid fever, Dr. Murchison's treatise will effect for our knowledge of the whole subject. The latter sums up previous information, adds largely to it, throws a flood of light upon debated points, and places these in the best position for subsequent examination. The work, indeed, at once becomes the great classic on continued fever in this country.

The chief immediate interest of the Report I now enter upon consists in the fact, that it presents an account (however imperfect) of the state of epidemic disease at a time when the health of the population, as measured by the rate of mortality, was above the average.

LAST QUARTER OF 1861.

England.—There was no unusual amount of fatal sickness throughout the kingdom in 1861; for the mortality was below the average in each quarter. In the last quarter of the year, the price of wheat was higher than in the same quarter of the two previous years, and meat dearer than in the corresponding quarter of 1860. The temperature of October was greater than had been observed in the same month since 1831, and before that year, since 1811. November was cold from the 1st to the 24th; then a warm period set in, which continued

* A Treatise on the Continued Fevers of Great Britain. By Charles Murchison, M.D. London: Parker, Son, and Bourn. 1863.

until the 24th December. The fall of rain in November (5·2 inches) was greater than had occurred in that month for forty-five years, with one exception. The year closed with cold weather. Pauperism had largely increased during the three months.

The mortality of the quarter exceeded that of the same quarter of 1860, but was less than the like period of 1859. The diminution of mortality, as compared with 1859, was noted in all the registration divisions, with the exception of the North-Western and the Northern. The excess in the latter division was unimportant; but that in the north-western counties was considerable, and arose from the higher mortality of Lancashire. The deaths in Lancashire were about two thousand more than in either of the two previous December quarters.

Fever, under various designations—typhus (?), typhoid, continued, and low—scarlatina, and measles, prevailed extensively in many parts of the country. Several towns and villages in the South-Eastern Counties suffered from typhus (so-called) and typhoid fever. An outbreak of the latter form of fever doubled the mortality of Steyning in Sussex. An account of this outbreak by Dr. Whitley, is given in the recently published (the fourth) Report of the Medical Officer of the Privy Council. Although the village is well situated, it would appear that its sanitary condition has been much neglected, and that, within the last few years, it has been the scene of epidemic outbreaks of cholera, small-pox, scarlatina, and diphtheria, as well as of typhoid fever. Scarlatina was prevalent at Woking, in Surrey; and an enormous, but little fatal, outbreak of measles occurred at Brenchley, in Kent. There were but ten deaths in about five hundred cases of the disease. Measles was also prevalent at Arundel, in Sussex. Diphtheria prevailed at Perry Hill, in Surrey; broke out at Ashurst, in Kent; and the malady was very fatal amongst the soldiers' children at Parkhurst barracks, in the Isle of Wight. Thirty-two deaths from measles and whooping-cough, and pneumonia and bronchitis following measles, were registered at Reading, in Berkshire; and nine deaths from small-pox at Windsor.

In the South-Midland Counties, puerperal peritonitis occasioned a sad fatality at Isleworth, in the extra-metropolitan division of Middlesex. There were no less than four women lying dead from this formidable affection at one time. Continued fever was also prevalent in several districts of Hertfordshire, Northamptonshire, Huntingdonshire, Bedfordshire,

and Cambridgeshire. Scarlatina was fatal at Aylesbury, in Buckinghamshire; and diphtheria at Peterborough. Measles prevailed at Newport Pagnell, Turvey (in Bedfordshire), and Wisbech.

In the Eastern Counties, continued fever, scarlatina, diphtheria, and measles, were prevalent in many parts. Numerous deaths were also registered from small-pox. One-fourth of the deaths recorded (twenty-five) at Litcham, in Norfolk, were from diphtheria. At Snettisham, in the same county, malignant sore throat and diphtheria were very fatal. Measles prevailed at West Flegg, and measles and whooping-cough at Hillington, both localities also in Norfolk.

In the South-Western Counties, continued fever prevailed in the Warminster and Mere districts, in Wiltshire; at Bere Regis, in Dorsetshire; at Gunnislake, in Devonshire; St. Clement and St. Just, in Cornwall; and Banwell and Keynsham, in Somersetshire. Dr. Bristowe has described the conditions of the outbreak at Gunnislake, in a report to the Medical Officer of the Privy Council, published in the Report already referred to. Typhoid fever, it would appear, is an annual visitant in that locality, and the disease has more than once assumed epidemic proportions. An outbreak of unusual severity occurred three years ago. "One of the most remarkable features in the place" (Gunnislake) writes Dr. Bristowe, "is the want of privy accommodation. In some few cases, indeed, two or three privies, with cesspools, are supplied for the use of eight or a dozen houses; but in the majority of instances, even in the centre of the town, no accommodation of any kind is provided, and hence the adult male population defæcate habitually in the gardens or in the road, and the women and children make use of the *pôt de chambre*, which they empty over the garden, on the dust-heap, or in any other convenient spot. Occasionally a wooden erection may be seen, having the external aspect of a privy, and used as such, but with only a crossbar or plank for a seat, and no cesspool whatever; the excrement being allowed to accumulate there, and diffuse itself thence for an unlimited time, or until it is required for manure." Drainage and cleanliness, as will readily be imagined, are regarded as superfluities in Gunnislake. Calstock, a neighbouring village, is, or rather was, in every respect a counterpart of Gunnislake, and like that village, used to be liable to outbreaks of fever. Not a case of fever has, however, occurred at Calstock during the last two years; and this immunity from the disease has followed on the almost complete drainage of the place, which was

effected rather more than two years since, and on the removal of a very large proportion of the pigs which at that time infested it."

Scarlatina and measles prevailed extensively in several districts. There were six deaths from the latter disease, and seventeen from the former, at Salisbury; measles, together with typhoid fever, raised the mortality above the average at Mere; scarlatina was very fatal at Camborne, in Cornwall, and Curry Rivel, Langport, in Somersetshire; a malignant type of measles prevailed at Dulverton, and this disease was the cause of twenty-one deaths at Yeovil, both in the last named county.

In the West Midland Counties, measles and scarlet fever were very prevalent in the Stroud district, Gloucestershire; and measles was also rife at Madeley, in Shropshire. Diphtheria prevailed at Worfield, in the latter county; typhoid fever at Burslem, and whooping cough at Cheadle, in Staffordshire.

In the North Midland Counties, continued fever prevailed in many parts of Lincolnshire, and in one or two localities in Leicestershire, Nottinghamshire, and Derbyshire. Several deaths from diphtheria were noted in the Lincoln and Gainsborough districts, the disease prevailing at the same time as scarlatina and typhus. Measles and scarlatina were very prevalent in the Basford district, Nottinghamshire.

In the North-Western Counties, fever prevailed at Bollington, Weaverham, Over, and Woodchurch, in Cheshire. Of fifty deaths in Bollington, twenty-two were recorded as from typhus and scarlatina. Of twenty-seven houses forming a street in this village, only two or three escaped infection. Of eighty-six deaths in Over, forty-three were from scarlatina. Continued fever, scarlatina, measles, and whooping-cough prevailed largely in Lancashire. Thirty deaths from scarlatina occurred at Wigan; thirty-eight at Little Bolton; thirty-four at Elton (Bury); thirty-five at Dukinfield (Ashton-under-Lyne), in which locality the disease is described as having been malignant; and thirty-one at Bolton. In Manchester the disease assumed a diphtheritic character. In the sub-district of St. Michael, Garstang, diphtheria had broken out for the first time, and occasioned six deaths at the beginning of the quarter. Towards the end of the quarter the disease appeared to have ceased.

An account of an outbreak of fever at Over Darwen, in Lancashire, in the course of the quarter, was read before the Society, during last session, by Dr. Greenhow.*

* The paper is printed in the present part of the *Transactions*, p. 337.

Typhoid fever prevailed largely in several localities of the West Riding of Yorkshire; and scarlatina and measles in the East and North Ridings. The former disease was very malignant at Market Weighton. An account of an outbreak of fever at Yeadon, in the West Riding, by Dr. Ord, who inspected the village by direction of the Privy Council, is given in Mr. Simon's fourth report. Dr. Ord says, "As regards the circumstances under which the fever appeared in houses: 1. All the best built and best kept houses escaped. 2. Of fifty-nine houses, in which ninety-eight well marked cases of typhoid occurred, seven were clean and free from surrounding sources of miasm, though built like the houses around them; in all the rest one or more of the conditions above specified [*i. e.*, certain insanitary conditions connected with the drainage and construction of the houses, privies, and pigsties,] were noted. It is proper to observe," he adds, "that the fever appeared in a period of unusual drought and great heat, when the sanitary arrangements of a town, ill-supplied with water, would be tested to the utmost."

In the whole of the Northern Counties, scarlatina prevailed very widely and fatally; and in one or two districts of Durham and Cumberland, typhoid fever and measles were prevalent.

In Monmouth and South Wales measles was very prevalent; deaths from scarlatina were recorded in one district of South, and one of North Wales; Milford suffered much from continued fever; and diphtheria occasioned eight deaths in the sub-district of Holt (North Wales).

The chief epidemic characteristic of the quarter was the wide prevalence of continued fever throughout England, and of scarlatina in the Northern Counties.

The Metropolis.—The mortality of London in the last quarter of 1861 did not much exceed that returned for the corresponding quarter of the previous year; and it was not high relatively to ordinary autumnal results. The deaths referred to zymotic diseases were 4,012, against 3,392 in the same quarter of 1860. By far the most destructive complaint of this character was scarlatina, which carried off 1,145 persons. In the corresponding quarters of 1858 and 1859, the deaths from scarlatina and diphtheria together numbered 644 and 1,814; in 1859 and 1860, from scarlatina alone 1,127 and 602. The disease appeared to be pretty generally diffused over all parts of the metropolis. There were, moreover, 231 deaths from diphtheria. In the corresponding quarter of the two previous years the mortality

from this affection was 141 and 165. The mortality from continued fever (624) was greater than since the same quarter of 1858. This disease was very fatal in the East districts. The mortality from whooping-cough (600) was in excess of that of the same quarter of the four previous years; so, also, was the mortality from quinsy, croup, and metria. The deaths from croup were indeed largely in excess, being 252 as compared with 148, 153, 81, and 169. The deaths from diarrhœa and cholera were in excess of the corresponding quarter of the three preceding years. Scarlatina, diphtheria, croup, whooping-cough and continued fever, were the chief epidemic diseases prevailing during the quarter.

A letter addressed to the Registrar-General by Dr. Acland, the Regius Professor of Medicine in Oxford, and referring to fever in that city and the basin of the Thames, is printed in the Registrar-General's report for the quarter, and merits the especial notice of the Society. After referring to the fostering causes of fever in Oxford, Dr. Acland points out that, in that district, "a larger measure than mere local improvement is required to work a thorough cure, and they are therefore not eager to promote lesser plans, which they know will prove ineffectual."

"The fact is," Dr. Acland writes, "*the drainage of the whole Thames valley above Teddington Lock ought to be in the hands of a Government commission;* there would then be some hope,

"1. That the towns on its banks would be induced to adopt the best known system for disposing of their sewage.

"2. That the upper Thames waters would be made as pure as possible, for the use of the metropolis.

"3. That the waters would be so regulated as to be quickly let off when accumulating, and retained at a proper level when falling.

"4. That the death-rates on the banks would be diminished.

"Drainage works have long been in progress in many parts of the upper Thames and its tributaries. Under the Act of last session these will probably be increased, but they have not been, nor are likely to be, on any large concerted plan, nor any uniform method. Great opportunities have been lost of buying up mills, of regulating locks and dams, and of making use of railway operations for controlling the streams. This is greatly to be regretted, because it may be safely assumed that, were the river and the lands near it under sound management, not only would the death-rate of

some districts be diminished, but the commercial value of much meadow land be increased. The latter consideration you may no doubt leave to landowners and capitalists; the former deserves your serious attention. A more thorough inquiry into the sanitary condition of this whole upper Thames valley than has yet been made would be both valuable and interesting. In constant and most obliging intercourse with the members of my profession over a considerable area, I have gathered many facts concerning the health of towns and villages and districts along the banks of the upper Thames; they are often curious and perplexing. They could be tested,—and a most instructive inquiry it would be,—only by a systematic investigation of the course of the river and its tributaries.

"I am inclined to think on the whole that it would appear,—

"1. That the working health of whole districts, and especially of Oxford, would be improved by proper river management, and a general system of drainage.

"2. That sometimes the flat parts, sometimes the slopes adjoining the flats, and sometimes the heights are the most unhealthy.

"3. That the soil modifies in a high degree the effects of the surface waters; a low place near the river, being on gravel, may be quite healthy, when a place further off, and higher, but on another soil, shall have continuous crops of fever.

"4. That in considerable areas ague has been very prevalent in the memory of man, and is now unknown; low fever (mild typhoid) having taken its place.

"5. That in the spots last-named further sanitary improvement would eradicate a great deal of the fever, and of the tubercular diathesis.

"6. That in estimating the condition of these localities we must always consider the habits, clothing, food, dwellings, and wages of the people, as well as the drainage and exhalations from the soil.

"7. That while no doubt the register of the deaths is a true test of the health of these regions, yet the physician sees, or thinks he sees, feeble power, tardy convalescence, distress and discomfort incalculable, which is not fully expressed in the death-rate, and which would also be relieved as it (the death-rate) diminished.

"The way to test these propositions would be to make a careful examination, in the main valley and its tributaries,

of the villages and towns on all the alluvial levels, on the slopes, and on the heights; noting the nature of the soil geologically; and to compare on the spot your registration returns for certain periods with the local knowledge thus acquired. The results would often be quite different from what would be expected. It would not be a very difficult undertaking, with the help of your office, and of the union medical officers. The truth is we ought to have such knowledge for all England; but I now press this restricted inquiry on your attention for two reasons: first, because it is feasible, from its limited and distinct nature, and secondly, because it would tend to purify and regulate part of the water supply of London. Why the Londoners do not rise up in arms against us provincials for remorselessly pouring our sewage down upon some of their water companies is a standing marvel. We may now assume that the elements of disease are carried in water; through what distance we do not know. Ordinary prudence should therefore keep the upper rivers above great towns as pure as is practically feasible.

Scotland. In Scotland the mortality of the last quarter of 1861 was below the average mortality of the corresponding quarter in the six previous years. There was, however, much sickness among the population, although not of a fatal character. Influenza, more persistent and accompanied by greater debility than usual, was very general over the whole of Scotland; and on the north of the Forth and Clyde, as in the north of England, scarlatina and diphtheria appear to have been the prevalent epidemics. Continued fever was also somewhat prevalent.

FIRST QUARTER OF 1862.

England. In the *first quarter* of the present year, in England, wheat was higher in price than in any quarter since 1856: potatoes were not cheap; beef was at the same price as in the same period of last year; and mutton was a penny a pound less in price. The mean temperature of the three months was 1°·6 above the average of twenty-one years. The character of the weather, as observed at Greenwich, is thus described by Mr. Glaisher:—

"During the whole of the three months the temperature of the air has been for a few days together cold, and then for a few days together warm, and so on alternately; the former, or cold periods, have varied from five to nine days, and the warm from seven to nine days, with one of fifteen days. The warm

periods have generally been of somewhat onger duration than the cold periods, and have also been more in excess of the average than the cold periods have been in defect; so that upon the quarter the temperature has been in excess, and would class as a warm period. I have no recollection of such a succession of hot and cold periods of nearly equal lengths."

The fall of rain in January was one inch and a quarter above the average of the preceding forty-five years; in February the fall was nearly the smallest which has occurred in this month since 1815, it having been less in 1821, 1834, and 1857; and the fall in March has only been exceeded twice since 1815, viz., in 1818 and 1851.

The returns of the Poor Law Board bore witness to the distress which unhappily prevailed in many districts. The average number of in-door paupers relieved on the last day of each week rose from 118,523 in the March quarter of 1860 to 143,926 in the corresponding quarter of this year; that of out-door paupers from 717,264 to 804,272.

The rate of mortality (2·447 per cent.) was somewhat below the average (2·489). The health of the quarter was at least as good as the same period of 1861, and better than that of 1860. An excess of mortality in Lancashire darkened the general returns. In the corresponding quarters of 1860 and 1861 the deaths in that county had considerably increased, being in the former year 16,024, in the latter 17,412. In the March quarter of the present year the mortality was no less than 18,652. Of the twenty-six registration districts of which Lancashire consists, there was an increase of the deaths returned over the March quarter of 1860, and in sixteen an increase over those of the same quarter of 1861. In certain districts the registrars referred the increased mortality to scarlatina, measles, bronchitis, and pneumonia, which had been prevalent; and by some it was thought that these complaints had found an active ally in the poverty and want which many of the unemployed thousands then suffered in the great seat of cotton manufacture.

"Facts have been adduced," observes the Registrar-General in his report for the quarter, "to prove that in instances of great depression of trade, like that which recently occurred in Coventry, the mortality of children is reduced, in consequence of the due amount of maternal care being bestowed on them, which in more prosperous times is withdrawn by the importunate requisition of factory labour. This is within limits. Nursing in straitened circumstances may be better for children than fulness of good cheer without it; but when hard times are

prolonged, and the small store that had been gathered in the day of full work is exhausted, the greatest amount of parental attention will not expel physical decline, sickness, or death itself from the dwelling."

In the South-Eastern Counties measles was prevalent and very fatal in many localities, and scarlatina occasioned eighteen deaths at Folkstone. In the South-Midland Counties, outbreaks of scarlatina and measles were recorded in two or three districts; and two deaths from diphtheria occurred at Ramsey, Huntingdonshire.

In the Eastern Counties, diphtheria and small-pox were very prevalent. Diphtheria was most fatal at Tollesbury, in Essex; and the disease prevailed at Holt, Forncett, Watton, and Snettisham, in Norfolk. Small-pox was "exceedingly prevalent" at Lowestoft, in Suffolk; it was also prevalent at North Walsham, in Norfolk, and eleven cases occurred (three proving fatal) at Harleston, and six deaths from the disease at East Wymer, both in the same county. Other cases of death from small-pox were also recorded in the county. Scarlatina prevailed in several districts, and an outbreak, complicated with diphtheritic sore-throat, took place at Wells.

In the South-Western Counties, scarlatina and measles were the most prevalent of epidemic diseases. Continued fever was rife in the parish of Plymstock, in Devonshire; and small-pox at Gwennap, in Cornwall.

The Midland Counties were very free from epidemic disease. Seven deaths from diphtheria took place at Bourton-on-the-Water (Gloucestershire); scarlatina was prevalent at Cleobury Mortimer, in Shropshire; and measles and whooping-cough at Bilston, in Staffordshire.

In the North-Midland Counties scarlatina was very fatal in several localities. Erysipelas was the cause of seven deaths in Leicester; small-pox was very prevalent at Lincoln Home; and diphtheria prevailed in the Gainsborough district. In Nottingham continued fever, scarlatina, and measles were active in the Basford district.

In the North-Western Counties scarlatina, measles, and whooping-cough prevailed most widely, and in several districts were very fatal; and in Yorkshire the most noteworthy facts were a large mortality from scarlatina in Sheffield, and the prevalence of this disease at Malton and Northallerton (in the latter place along with fever, diphtheria, croup, and whooping-cough, and in the former with typhoid fever), and the prevalence of small-pox at Horton, Bradford.

Scarlatina and measles were still most rife in the northern counties, and diphtheria occasioned nine deaths at Greystoke, in Cumberland. In Monmouthshire measles was prevalent, as also in one or two districts of North and South Wales. Scarlatina and diphtheria were common in Kington, South Wales, and in Llansaintffraid, North Wales. Diphtheria was also prevalent at Holt and Denbigh, while continued fever had broken out at Hope, in North Wales.

The Metropolis. The mortality in London this quarter was less than in the two corresponding quarters in 1860-61. But although the total mortality was low, that from the zymotic class of diseases was high. To this head were referred 4,174 deaths, the corresponding numbers in the two previous years having been 3,380 and 3,674. The deaths from continued fever rose in the quarter as high as 991, and were more than twice as many as usual. Those from scarlatina, diphtheria, and croup, rose respectively to 774, 216, and 284. Of the 774 deaths from scarlatina, 236 occurred south of the river. The continued fever prevailed chiefly in the east districts and on the south side of the Thames.

Scotland. The mortality in Scotland was considerably above the average of the corresponding quarter in the seven previous years. Influenza (ending, it is said in the Registrar-General's report for the quarter, "in gastric, or a mild form of typhus fever") and inflammatory affections of the respiratory organs were very prevalent. In several districts a low form of continued fever affected many persons. The individuals who suffered "seemed (says the Registrar-General) to be attacked more as if it were a regular epidemic, arising from purely atmospheric influences; and it would appear that most of the cases of fever which are commonly met with in the various districts do so originate, although our sanitary reformers, with one idea alone as to the origination of disease, too often erroneously attribute that complaint to faulty sanitary arrangements. That faulty sanitary arrangements will aggravate the disease once originated, and impair the health of those living in unwholesome and unaired houses, besides rendering them more prone to the attacks of the disease, no one will deny; but it is time that we should open our eyes to the true facts of the case, and allow that almost all our diseases really originate in atmospheric agencies, and that our sanitary arrangements are mainly of use in strengthening the body against these agencies, and enabling it more easily to resist them, or throw off disease when affected by them."

I quote these opinions in order to contrast them, in another part of this report, with certain observations on the genesis of fever by Dr. Stark, the statistical head of the department of the Registrar-General for Scotland, in the third detailed report of the department.

Whooping-cough and measles were epidemic in several districts, and "various affections of the throat, in many instances assuming the form of diphtheria, attended the pulmonary attacks, and were the cause of numerous deaths."

SECOND QUARTER OF 1862.

In the *second quarter* of the present year the average price of wheat was higher than that of the same period in either of the two previous years; but meat was cheaper than it had been for a considerable time.

The mean temperature of the three months slightly exceeded the average of the same period in twenty-one years. The mean temperature of April was higher than that of any April since 1854; that of May was higher than it had been in this month since 1848; whilst the June of this year was the coldest that has occurred since 1854. More than an average quantity of rain fell in April. The amount of rain at Greenwich was 7·4 inches.

The aggregate amount of pauperism, although less than in the preceding quarter, was considerably greater than in the corresponding quarters of 1860 and 1861.

The rate of mortality was less than in the two similar quarters of 1860-61, and less also than the average of the ten preceding years. The weather generally was favourable to health. The mortality was again greatest in the north-western division, which consists of Cheshire and Lancashire. The death-rate of these counties was 2·417 per cent., as compared with 1·744 in the south-eastern counties — the healthiest division during the quarter. The Registrar-General points out, in his quarterly report,—

"That the high mortality of Lancashire is not a newly discovered phenomenon, the cause of which might probably be found in the distress that prevails in that county at the present time. It may be traced," he adds, "in the annual tables of mortality during a long series of years. The average rate of mortality in Lancashire in the ten years, 1851-60, was 2·430 per cent. In 1852 the death-rate rose to 2·865; but with increased attention paid to the public health, the returns of later years have shown most favourable results."

The few registrars who ventured, in their reports for the quarter, to make any observations on the connexion of the manufacturing distress with the mortality, expressed opposite opinions.

Epidemic disease showed little activity during the quarter. There was an outbreak of scarlatina at Gravesend, in Kent; the disease was also prevalent at Landport, in Hampshire. Several cases of diphtheria occurred at Worth, and measles was general at Billingshurst, in Sussex. In the South Midland Counties measles was prevalent in certain localities, and that disease and scarlatina caused several deaths in Waddesden, Bucks. A fatal case of diphtheria occurred at Edmonton. In the Eastern Counties small-pox prevailed extensively at Lowestoft, in Suffolk, and broke out at Docking, in Norfolk. Scarlatina and diphtheria were prevalent at Holt, and several cases of typhus (so-called) occurred at King's Lynn, in Norfolk. Typhoid fever was noted at Hadleigh, in Suffolk. In the South-Western Counties measles was very fatal at Plymouth, and scarlatina prevailed at St. Agnes (Truro), Cornwall. Several children died from diphtheria at Alphington, Devonshire. In the West Midland Counties measles was prevalent at Hereford, and scarlatina at Wellington, in Shropshire. In the North Midland Counties seven deaths from diphtheria were recorded at Long Sutton (Holbeach), and six at Lincoln Home, and three in Lincoln; and an epidemic of typhoid fever prevailed at Wittingham (Gainsborough). Fever was also prevalent at Belper, in Derbyshire. In the North-Western Counties scarlatina, measles, and whooping-cough were most noted, continued fever being referred to in one or two districts only. In Yorkshire there was an outbreak of typhoid fever at Horsforth, in the West Riding, and small-pox was prevalent at Bradford. Two cases of cholera, one fatal after thirty hours, were recorded at Bramham. In the East Riding scarlatina and diphtheria were prevalent in the village of Withernwick. In the North Riding four deaths occurred from diphtheria at Rillington (Malton); and typhus, low fever, scarlatina, and whooping-cough were rife in Northallerton. In the Northern Counties scarlatina and measles were still widely prevalent.

The Metropolis. The mortality in London was above the average of the four corresponding quarters of 1858-61. A fourth part of the total number of deaths was from diseases of the zymotic class. An excess under this head was caused by scarlatina and continued fever, but chiefly by the latter, which was nearly three times as fatal as usual in the spring quarter. Continued fever indeed was fatal in 1,015 cases, and

was still most prevalent in the eastern districts. Scarlatina came next in order of fatality; then whooping-cough, measles, diarrhœa, diphtheria, and small-pox, in the succession given. Compared with the corresponding quarters of 1858-59-60-61, the mortality from scarlatina, typhus, and croup was in excess; with the like quarters of 1858-59-60 the mortality from measles, diphtheria, whooping-cough, and diarrhœa.

Scotland. The mortality in Scotland during the quarter was considerably above the mean mortality of the corresponding quarter of the seven previous years. Cold rainy weather, an excess of moisture, and want of sunshine apparently acted most prejudicially upon the health of the people.

"In so far as appears from the registrars' notes," says the Registrar-General, "this high mortality does not appear to have been caused by the prevalence of any particular disease, but rather by the mortality of all the usual diseases having been rendered higher by unfavourable atmospheric agencies. Whooping-cough and measles, with more or less bronchitic complication, have been general over the country. Sore throats, ulcerated sore throats, and diphtheria have been remarked in scattered localities, and in Mid and South Yell the sore throats appear to have been accompanied by an affection of the hands, which raises the suspicion that sore throat and diphtheria in the human subject are but a variety of that epidemic disease in cattle known by the name of murrain, or epizootic aphtha, characterised in them by the aphthous and ulcerated mouth and sore hoofs. A few cases have been brought under our notice by an intelligent veterinary surgeon, in which it was clearly established that the milk of cows affected with murrain caused aphthous mouths and diphtheria in children, and fatal aphthæ, terminating in ulcerous affections of the mouth, throat, and windpipe in the case of pigs."

I shall have occasion again to refer to the opinion here expressed.

THIRD QUARTER OF 1862.

In the *quarter ending the 30th September*, wheat and potatoes were dearer than in the same period last year, while the price of flesh-meat was comparatively moderate.

The mean temperature of the air at Greenwich was below the average of the same three months in twenty-one years. The coldness of the season would have ranged still higher in meteorological notation, but that warmer weather in the latter

half of September modified the final result. The total fall of rain in the quarter was not excessive.

As in the three previous quarters, pauperism had largely increased as compared with the corresponding quarter of 1861.

The mortality was less than in the same period of 1861, but not so low as in 1860.

"The cold summer of this year," remarks the Registrar-General, "was less healthy than the still colder summer of 1860, but healthier than the warmer summer of last year. A cold winter makes frequent funerals: it cuts off quickly the old and infirm; but it may be admitted amongst ascertained facts that a cold summer, with rain enough to wash and sweeten the earth and air, is favourable to health, and especially to the health of children. The weather which the farmer most desires for his harvest operations is not the most salubrious for the people who are to be afterwards fed with his produce. It is the business of sanitary science to assist in reconciling these separate interests."

The annual rate of mortality in the quarter was 1·797 per cent. The average of ten previous summers (1858-61) was 2·020 per cent. There is but a single example of so low a rate in these ten years. In 1860 the rate was 1·718. It is seldom that the mortality of England in summer, even in the healthiest season, is so low as 1·9 per cent.

The mortality of Lancashire and Cheshire in this quarter sank a little below that of London. Several districts in these counties showed, however, a higher rate of mortality, and among them Liverpool. The excess in this town was caused by diarrhœa and scarlatina. Many of the towns most severely affected by the manufacturing distress exhibited a diminution mortality.

The Registrar-General's observations upon this last-named fact deserve particular notice:—

"A few of the Registrars," he writes, "witnessing a reduction of the mortality with the distress that prevailed in their districts at the same time, have been tempted to speculate on the facts, and as those officers in the course of their duties are in frequent communication with the labouring classes, their opinions may be quoted. The Registrar of Wigan states that more freedom to breathe the fresh air, inability to indulge in spirituous liquors, and better nursing of children, are believed to have improved the public health. The Registrar of Little Bolton holds that the decrease of deaths is mainly due to a greater amount of domestic superintendence. The Registrar

of Hulme thinks that the even temperature of the weather and increased attention paid to young children have caused the decrease. The Registrar of Knott Lanes (Ashton) attributes the result to absence of epidemics, mildness of the weather, out-door exercise, maternal care; also to parish relief and charitable contributions, by means of which food has been obtained not sufficient for health but enough to mitigate distress and prevent hitherto an increase of mortality. The Registrar of Preston sub-district also refers to the good effect of fresh air, nursing, and mildness of the weather; and he adds —'In the weeks ending August 2nd, 9th, 16th, 23rd, and 30th, I registered 30, 25, 29, 24, and 37 deaths; but in the corresponding weeks of 1861, when work was more plentiful and people in better circumstances, they were 50, 40, 50, 42, and 57. The peaceful and dignified conduct of the operatives entitles them to the warmest sympathy and support of all classes.' The Registrar of Ancoats (Manchester) is convinced that the low rate of mortality in his sub-district was due to the coldness of the summer, in consequence of which diarrhœa did not prevail.

"It has been recently asked whether starvation is good for the health, and attempts have been made with indifferent success to solve a difficulty which has not arisen. Nobody will seriously contend that inadequate supplies of food are conducive to health: it is too well known that famine has often slain its thousands; but it is right at the present time to guard against deductions from the returns of mortality which they do not justify. It has been assumed as obvious that if the death-rate in the distressed districts does not exceed or fall below that which has prevailed in times of prosperity, the relief obtained by the unemployed from public and private sources has sufficed to maintain them in health. The allowances may or may not have been sufficient in amount, but the returns of mortality furnish no evidence of the fact; they only show that extreme consequences of famine have not yet been manifested. Recreation in the open air, moderation in meat and drink, and the due administration of domestic offices are beneficial to health; but if they have been compensation for the loss of wages, the tables above quoted are silent on the point. These tables prove that under circumstances favourable to human life the mortality in England was reduced last quarter, and that the districts of the cotton manufacture were not prevented by the distress from participating in the benefit; they cannot show that if Lancashire had been prosperous the health of its people would not have been still better and a

further reduction of mortality obtained. It is matter not of speculation but fact that winter approaches, and that the cold of winter swells the bills of mortality by attacking the old, the young, and the infirm of middle age; and it needs not the gift of prophecy to predict that if cold and want, prolonged and embittered, attack a population with combined force, it must fall as if under an armed host. To avert or mitigate such a result, food, clothing, bedding, and firing must be dispensed by a public or private charity, that can rise to the greatness of the occasion."

Prior to the publication of the Registrar-General's Report, scattered cases of true typhus had occurred in Preston and Chorley, and since September the disease has increased to so great an extent in the former town, as to need special provision to be made for the reception and treatment of cases. The history of the outbreak at Preston, so far as at present known, is as follows:—In July one or two instances of true typhus were recorded. In August eight cases occurred. In September upwards of forty were registered. In October fifty-one. Since October, the number of cases has averaged about twenty per week. The determining causes of the outbreak are painfully patent. At the present moment, the greater proportion of the population of Preston are living at a cost per week which twelve months ago sufficed but for a single day; they have, indeed, to eke out one day's food over seven days. Whatever articles of furniture and clothing could by any possibility be spared, have been sold by them to add to their means of subsistence. Immediately prior to the first frost, blankets had almost entirely disappeared from the houses of the operatives. To obtain that warmth, of which a want of suitable or sufficient clothes and an insufficiency of fuel deprive them (and partly to escape rent), several families huddle together in one house, or in one chamber. Thus is produced overcrowding of the gravest character. Every day, every fall of a degree of temperature is extending the evil and diminishing the probability of escape from a pestilential extension of the disease. With apt subjects for the reception of the infection, apt conditions for its propagation, and both subjects and conditions such as alone are needed to develope typhus, little hope exists of warding off or mitigating the calamity, except by the most immediate and strenuous exertions for increasing the amount of relief, not merely in food, but in clothing and fuel also, to the famine-stricken; and in making arrangements by which each case of the formidable disease can be weeded out as it occurs. Preston and other towns have become fully awake to the gravity of

the crisis, and there is some reason to hope that the present comparatively stationary condition of typhus in the former town is due to the efficient steps which have been taken for giving additional relief to the fullest practicable extent.

It is not unimportant to note, that London, within the past twelve months, has been suffering from an epidemic of typhus, in nature and immediate origin probably analogous to that with which Lancashire is now threatened. The account of this epidemic, as recorded by Dr. Murchison, in his recent work on *Fever*,* is so full of instruction, and so clearly indicates the necessity of not being lulled into false security by the present absence of activity in the extension of the typhus now present in Preston, that (although breaking the order of my Report) I shall quote it here.

"In the years 1858, 1859, and 1860," Dr. Murchison writes, "typhus was so rare a disease in London, that the students of the various hospitals had no opportunity of seeing a single case, while serious thoughts were entertained of converting the fever hospital into a hospital for general diseases, its mission for the treatment of typhus having, as some thought, been fulfilled."

Dr. Murchison next proceeds to point out that a similar decrease of typhus took place in Scotland, and that the disease was also less prevalent in Ireland. He then continues:—

"But in 1861, typhus again became epidemic. At the close of the severe winter of 1860-61, a larger number of cases were admitted into the London Fever Hospital, than at any time since 1857. About the middle of December, the cases suddenly increased, and since January 1862, the number of admissions for typhus have exceeded that at any previous period of the hospital, while many patients have been refused admittance for want of room. From January 1st, to June 30th, no fewer than 1,107 cases of typhus were admitted into the fever hospital, and numerous cases were also under treatment in the other metropolitan hospitals. The deaths from 'typhus,' returned to the Registrar-General, were more than double the ordinary average. The circumstances preceding this sudden increase did not differ from those of former epidemics. There was no failure of the crops in England; but for some time before there had been great and increasing distress among the poor of London, consequent on the organised system of strikes, the effects of which had only temporarily been averted by the relief from the societies for promoting the

* Pp. 52-53.

short-hours movement. As in 1826, 1836, and 1856, an *artificial* scarcity was the result. In addition to this, the great distress in the provinces caused the poor population of London to be *condensed* by the arrival of labourers from the country in search of work. It was ascertained that almost all the first cases admitted into the fever hospital were male tramps, with no fixed residence, out of employment, and suffering for many weeks from want, and that many of them had only been a few weeks in London; but there was no evidence that they had come from infected localities, or imported the fever into London. Only a small proportion of them were Irish, and none had arrived recently from Ireland. Overcrowding, with destitution, appears to have occasioned the epidemic."

To resume the history of the quarter:—Scarlatina, which, in the previous three quarters, appeared to be most widely prevalent in the northern portion of the kingdom, in the present quarter, showed itself more generally in the southern half. The disease was unusually fatal throughout the three months, at Landport, in Hampshire, and was very fatal at Winchester. It prevailed also in many districts in the South-Midland, Eastern, South-Western, and West-Midland Counties. Small-pox raged in the parish of Little Hampton, in Sussex. Much typhoid fever occurred in several parishes in Northamptonshire. Diphtheria was very fatal at Chelmsford, and it prevailed at Kelvedon and Braintree, in Essex, and at Birmingham. Measles was fatal at Enfield, in Middlesex, and Wolstanton, in Staffordshire. Twelve children died from small-pox at Camborne, in Cornwall.

In the North Midland Counties, scarlatina and diphtheria prevailed at Swineshead; and an outbreak of fever occurred at Corby in Lincolnsire. Corby has a population of rather more than 800. Forty cases of fever had taken place at the time of the last report, but none had proved fatal. In the North Western Counties, scarlatina prevailed in several districts of Cheshire; and diphtheria had occasioned four deaths at Chester. In Lancashire, with the exception of Liverpool, the West Derby, Wigan, Bury, Oldham, and Ulverstone districts, there has been little epidemic disease. In Liverpool, diarrhœa was becoming fatal and scarlatina was prevalent. Gastric fever prevailed at Litherland, West Derby. Continued fever, diarrhœa. and dysentery had become more general at Wigan towards the end of the quarter. Scarlatina (40 deaths) and diphtheria (9) had proved fatal at Oldham; and measles and whooping cough prevailed at Dalton (Ulverstone).

In Yorkshire, typhoid fever had broken out at Airton, a village in the West Riding; scarlatina became prevalent at Meltham (Huddersfield), and small-pox at Halifax. Small-pox still continued at Bradford, and diarrhœa, fever, and scarlatina were becoming prevalent in Leeds. Three deaths from diphtheria occurred at Sheffield; and a serious outbreak of typhoid fever happened in Rotherham. The local officer of health, Dr. Shearman, entertained the opinion that this outbreak had arisen from a deficiency of the water-supply to the town. Diphtheria prevailed at Oldborough, in the East Riding.

In the Northern counties, scarlatina is reported to have been unusually prevalent in two localities only, Durham, and Northamshire (Berwick); but small-pox was prevalent in several districts of Durham and Northumberland. Diarrhœa and whooping cough were prevalent, although not very fatal, at Newcastle. Six deaths from diphtheria occurred at Brilley, South Wales; five at Holt, and four at Wrexham, North Wales.

The Metropolis. The mortality in London was higher than in the two previous summer quarters, and not much less than one-third of the deaths arose from zymotic diseases. Diarrhœa (956 deaths) was the most fatal of this class of affections; and next in order of fatality came scarlatina (841), continued fever (833), measles (645), whooping-cough (327), croup (220), and diphtheria (144). With the exception of whooping-cough and diarrhœa the mortality of these maladies was greater than in the corresponding quarters of the four previous years. Cholera was the cause of 89 deaths as compared with 140 in 1861.

Scotland. The mortality was considerably above the average of the corresponding quarter of the seven previous years. The high mortality is attributed by the Registrar-General "to the unfavourable effect which the damp, cold, rainy weather had had on all diseases, causing the general mortality to be increased." There was no increase in the prevalence and fatality of bowel complaints. The Scottish death returns show that it is only when the mean temperature rises above 58° and approaches 60°, that these complaints become prevalent; and their fatality increases with the rise of temperature. But the mean temperature of July was only 53°·8; of August, 56°·0; and of September, 53°·4. Consequently, nearly as great an absence of bowel complaints was observed in these months as in March, April, and May. Over the whole of Scotland, affections of the throat seemed to have been on the increase, and showed a tendency to assume a diphtheritic form. Diph-

theria was first noticed in the epidemic form in Scotland in the year 1857, and the disease has been on the increase ever since. During the past quarter it was especially prevalent in the northern half of Scotland. Measles in a mild form among children was the principal epidemic affection of the northern counties; while scarlatina apparently prevailed more in the counties adjacent to England.

Reviewing the whole of the twelve months, the following results are arrived at:—

The health status of the English population, as estimated from the unusually low rate of mortality throughout the year, was generally good, notwithstanding the dearness of provisions and the excessive amount of pauperism. The health status of the Scottish population was markedly inferior to its average condition, as shown by the large amount of sickness prevalent in the last quarter of 1861, and the high rate of mortality since the commencement of the present year.

It is well to mark, however, that the average death-rate of Scotland is below that of England. Thus, during the six years 1855-60, the annual proportion of deaths in England was 219 per 10,000 population; during the same period in Scotland the proportion was 208.

The high range of temperature during the winter months, and low range during the summer, in England, exercised a favourable influence over the health, notwithstanding much variableness of the weather and wetness. In Scotland the same conditions of temperature and weather existed, but to an exaggerated extent; and the great changes which were experienced, and especially the undue humidity of the atmosphere, were apparently the chief fostering causes of the influenza and throat affections which seem to have been more common there than in England.

The epidemic diseases most prevalent in England were continued fever, scarlatina, measles, diphtheria, whooping-cough, and small-pox. In Scotland the same diseases, with the exception of small-pox, and in addition and more particularly sore-throat, often assuming a diphtheritic character, and accompanied by diphtheria, played the chief part in the epidemiology of the year.

In both parts of the kingdom continued fever prevailed most commonly in the autumn quarter of 1861; and in England the affection would appear to have been more general in the northern districts. In both countries, also, scarlatina was widely prevalent in the northern counties in the last

quarter of 1861; in both countries the disease has shown itself more active in the southern counties in the quarter last past.

Measles prevailed extensively, and in some instances very fatally, in the winter quarter, in England, and, so far as may be judged from the data, chiefly in the two opposite extremities of the kingdom; in Scotland the disease appears to have been most prevalent in the spring and summer quarters of the present year.

Diphtheria in England was principally fatal in the autumn quarter, but it has prevailed more or less in every registration district during the twelve months. In Scotland the disease, together with sore throat, appears to have been epidemic throughout the year.

Whooping-cough was widely prevalent in England during the autumn and winter quarters; in Scotland during the winter and spring.

Influenza was epidemic in Scotland in the first half of the year.

Finally, small-pox broke out in many districts of England, but more especially in the Eastern, and South-Western and Northern Counties and in Yorkshire.

None of the outbreaks of the diseases referred to as occurring in England at any time during the twelve months assumed what may be termed general proportions: they were emphatically local irruptions. But the dispersion of the various maladies, or of their centres of manifestation over the kingdom; the cropping out or exaggeration in different localities; and the effects apparently exercised upon the sickness and mortality of different districts without heightening that of the whole kingdom above the average, present a study of no ordinary interest. From this study we are probably justified in concluding that it is in dealing with these local outbreaks of disease, and the conditions on which they depend in ordinary periods, that our best chance consists of warding off the wider spread and more deadly outbreaks of extraordinary periods.

The detailed mortuary returns for Scotland extend as yet only to the year 1857; but the returns for England are brought down to 1860. From the latter, then, we may obtain information as to the status of the epidemic diseases referred to as most prevalent, in this country, almost immediately preceding the period I have discussed.

Since 1857 the mortality from continued fever has slowly declined. In that year the deaths from this cause were 19·016; in 1860 they amounted to 13·012.

In 1855 the mortality from scarlatina was 17·314. In

1856-57 the number of deaths from this disease fell considerably, in the latter year the mortality being 12·646. The year following, the number of deaths increased enormously, becoming well-nigh doubled—the amount being no less than 23·711. In 1859 the number fell to 19·310; and in 1860 it became as low as 9·305. Prior to 1855 deaths from scarlatina, cynanche maligna, and diphtheria, are not separated in the Registrar-General's reports. Whether the detailed reports of the Registrar-General will show an increase of the mortality in England from scarlatina during 1861 and 1862 as great as has occurred in London, cannot be predicted. It is certain, however, that the activity of scarlet fever has been considerable in many parts of the kingdom.

The deaths from cynanche maligna in 1855 amounted to 199; in 1858 to 1,770. In 1860 the mortality from the disease had decreased to 376.

The deaths registered from diphtheria in 1855 numbered 186; in 1859, 9,587. In 1860, the mortality from this disease had decreased to 5,212.

The mortality from measles was largely augmented in 1858, and there was a steady increase in the number of deaths from the disease in the two subsequent years.

The mortality from whooping-cough in 1860 was the lowest since 1852.

The mortality from small-pox had declined from 6,460 in 1858, to 2,749 in 1860.

The reduced rate of mortality throughout England which occurred in 1860, was chiefly due, Dr. Farr remarks, to the decline of the number of deaths from scarlatina, diphtheria, and diarrhœa. The decrease in the deaths from small-pox, erysipelas, and cholera, also contributed to the favourable result.

The detailed reports of the Registrar-General for Scotland are brought down to 1857.

Since the beginning of last year, no less than three detailed annual reports—those for 1855, 1856, and 1857—have been published by the Registrar-General for Scotland, thanks to the indefatigable labours of Dr. Stark. The reports of this gentleman to the Registrar-General upon the annual returns of births, deaths, and marriages, abound with deductions of the highest interest, and merit the attention of all epidemiologists. Consistently with the plan of this report, I can only direct attention to one or two points in Dr. Stark's third report, which will throw light upon observations previously made. I have already pointed out the less death-rate of Scotland as compared with England. Dividing the inhabitants of

Scotland into three great groups, according as they dwell in Insular, Mainland-Rural, or Town districts, it is found that the proportion of mortality varies very greatly, being largest in the towns, and smallest in the insular districts. Thus in 1857, while in the last-named districts the number of deaths to every 10,000 persons living of all ages was 140: in the Midland-Rural districts the number was 174; but in the Town districts 268. This fact, as Dr. Stark observes, "shows in the clearest light that agencies are at work in towns highly prejudicial to health and to life, all of which merit the deepest study of the sanitary reformer." The heaviest mortality falls upon children under five years of age.

The mortality from zymotic diseases in Scotland in 1857 constituted 24·21 per cent. (nearly one-fourth of the total mortality), and was in the proportion of 501 persons to every 100,000 living at all ages—the exact mean of the two previous years. In England this class of diseases would appear to be less fatal. Thus, the mean of the deaths from zymotic diseases in this country in the three years 1855-57 was only 448 in the same proportion of population, the average of 1857 being 474.

Upon this result, Dr. Stark remarks:—

"This fact merits some notice, inasmuch as it might have been expected that, as the total deaths in all Scotland are lower in proportion to the population than the total deaths in England, so the zymotic diseases, which cut off nearly a fourth of all who die, would have borne some relation to the total deaths. As the comparison of a three years average of the mortality of the zymotic class of diseases shows that the deaths therefrom are proportionally very much more numerous in Scotland than in England, it seems to prove that the causes which favour their propagation and fatality are more rife in Scotland than in England.

"The sanitary inquiries which have been carried on with such vigour over the country, have, of late years, done much to enlighten us as to the agents which tend to propagate and render fatal the epidemic class of diseases when these once appear among a community. These inquiries have proved, by the most incontestable evidence, that want of ventilation, close rooms, foul air, exhalations from an undrained locality, from stagnant or choked drains, from foul cesspools, and from manure heaps, that the overcrowding of human beings in confined rooms, the overcrowding of houses so that they cannot be sufficiently ventilated nor exposed to the sun, an insufficient supply of food, etc., are agents which contribute most power-

fully to invite attacks of epidemics, and render them fatal when once they break out.

"Any one who is familiar with the houses of the lower classes in the large towns, and with the cottage dwellings of the inhabitants of the small villages, and of the rural population in the two countries, will probably have no difficulty in convincing himself that no other result than that above indicated could have been anticipated. The more cleanly habits of the people of England, their less crowded dwellings, their better ventilated rooms, the absence of the filthy miasmatous pool before their doors; perhaps, also, their more abundant diet would, to the sanitary inquirer, sufficiently account for the much lesser prevalence and fatality of epidemic diseases among the inhabitants of England, and would serve also to indicate in what direction our efforts should be made, in order to increase the health and lengthen the life of the inhabitants of Scotland."

It is worthy of note, that the Registrar-General for England, in commenting upon the death-rate of Scotland in 1855, in his last report, observes—"That while the rate of mortality in Scottish towns was 2·64 per cent. that year, that of English towns was but 2·49, that of London being 2·43. The strong point of the Northern Kingdom seems to be in her rural and especially insular districts."

Continued fever is the most fatal epidemic disease in Scotland, and the mortality from this cause would appear to be much higher than in England. As might be anticipated, the malady proved to be more fatal in town than country. Thus, in 1857, the deaths from continued fever in the Insular districts amounted only to 49 in every 100,000 persons; but in the Midland-Rural to 109; and in the Town districts to 133.

The large fatality of zymotic diseases in Scotland, absolutely and as compared with England, and the great prevalence and high death-rate of continued fever, brought to light by the detailed reports of Dr. Stark, together with the observations of that gentleman upon the causes of this prevalence, will naturally throw considerable doubt upon the observations of the Registrar-General for Scotland, in his March report, on the little part which sanitary defects have, in his opinion, played in determining outbreaks of continued fever in Scotland, even admitting to the full the influence of other conditions.

Dr. Stark's analysis of the relation of the mortality of Scotland to external agencies shows that "In proportion as the mean temperature descends, in much the same proportion do the deaths increase; while, as the weather

improves, and the mean temperature rises to a certain point, in the same proportion do the deaths decrease. In Scotland, however, whenever the mean monthly temperature of the summer months rises above 55° and approaches 60°, an increase of deaths is noticed; the increase being almost invariably proportioned to the rise of the mean monthly temperature above 55° Fahr. As the diseases, however, which are induced by the high temperature (bowel complaints) are not generally rapidly fatal, and go on after the cause which induced them ceases to operate, it generally happens that no small portion of deaths caused by that class of diseases occurs during the month which follows that in which the high temperature occurred."

A like series of facts has been educed by Dr. Tripe, the Medical Officer of Health for Hackney, in an examination of the Medical Meteorology of London. I would refer to a highly interesting paper by this gentleman in the last number of the *Proceedings* of the British Meteorological Society, in which he subjects the mortality of the three years 1859, 1860 and 1861, to an examination in relation to mean temperature.

It remains for me briefly to notice the chief facts relative to the Epidemiology of the Metropolis during the twelve months. The most noteworthy of these facts, the outbreak of typhus, I have already sufficiently dwelt upon, following Dr. Murchison's account. The mortality from continued fever, doubtless owing to the outbreak of typhus, was in excess of any like period since 1848. Indeed, the mortality of the three quarters of the present year alone (2839) is in excess of that of any year since the period named. The true character of this epidemic could not have been rightly understood except by the careful distinction of the forms of continued fever, nosologically and etiologically, insisted upon by Dr. Murchison.

The mortality from scarlet fever was but a little below that from continued fever during the twelve months under observation—the total mortality from the former malady being 3437; from the latter 3463. Next in order of mortality comes whooping-cough. Continued fever, scarlet fever, and whooping-cough, were the three great epidemic affections of the twelve months. The mortality from continued fever increased to a maximum in the second quarter of the present year; the mortality from scarlatina was at its maximum in the last quarter of the past year, then decreased through the two succeeding quarters, but largely increased again in the quarter just passed. The mortality from whooping-cough was greatest in the first quarter of the present year. Diphtheria was still largely fatal, having caused a total mortality of 625.

I have forborne to speak of the results of the Census. These will be best dealt with when the General Report is published. Certain observations of the Registrar General on the results of the census in London may, however, here be fitly alluded to.

The rate of increase of the population between 1851 and 1861, was equal to 121 daily. Of this average the proportion due to the excess of births over deaths was 72; to new arrivals and settlers in the metropolis 49. "Whether London is equal to this task of providing by new and improved arrangements for this constant accumulation of human beings within its limits," remarks the Registrar General, "still remains to be determined by experience. When a family increases in its narrow lodging, in circumstances of dirt and squalor, that increase which should be its blessing becomes its bane. *And in a city or a state the growth of its population is not a strength to be trusted, but a weakness to be feared, if improvement in its physical and moral condition is not commensurate with the growing urgency of its wants.*"

Directing attention to the two great outbreaks of cholera, and the irruption of influenza in 1847, the Registrar-General further observes that, although these outbreaks "furnish the most remarkable passages in the sanitary history of the metropolis during the last twenty years, they cannot justly be regarded as its worst features. Other diseases more frequent in their occurrence and persistent in their character, and also more wasteful in their effects, mark the whole period. Heavy bills of mortality forced public attention; and in the course of these years important measures for the improvement of the public health have been undertaken, and some proof that they have not been unfruitful has been obtained. Health officers have been appointed for the city of London, for Marylebone, and the other metropolitan districts. Inspectors of nuisances have acted in co-operation with them. Drainage works have been carried out, and are in progress. The water companies obtain their supply at higher positions in the river, and subject it to improved filtration. The markets are inspected, and attempts made, with partial success, to protect consumers against unsound meat, and noxious, fraudulent compounds. Hospital accommodation is extended; and, what is of prime necessity, the working classes have probably become more awakened to the care of their own health—to the importance of keeping their dwellings sweet and dry. This task, which is imposed on the people themselves, and can only be performed by them, it is the object of police regulations to render possible, and unless it is fulfilled, public works will

comparatively little avail. Altogether there is abundant proof of that increased regard for human life that attends civilisation; and though much remains to be accomplished, it is true, according to the proverb, that 'a work begun is half done.'

"In the ten years, 1840-9, the mean rate of mortality in London was 2·51 per cent.; in the subsequent decennium, 1850-9, it fell to 2·36 per cent. It is still more satisfactory to observe, that the rate of mortality *in each of the last three years*, 1859-61, has been less than the lower of the two rates that have just been mentioned. In 1860, the rate was 2·26; 1861 it was 2.32. If the mortality of London were confined permanently within the limit represented by the mean rate of the last three years, the effect of that reduction in the population, as it exists at present, would be that more than four thousand persons would survive annually whose lives would drop under the mean rate derived from the twenty years, 1840-59. And if measures that have been already adopted, are not relaxed, the amount of benefit will be increased, as the population that is the subject of it is increased. But a higher standard of health than any which the present tables show, is possible, and, it may be hoped, will be attended."

The action of the Officers of Health for the metropolis upon the sanitary welfare of the population is only to be rightly understood by the study of their separate reports, which are of great interest. The action of the Association of these officers admits of being more readily epitomised, and thanks to the courtesy of the secretary, Dr. Hillier, the Health-Officer for St. Pancras, I am enabled to lay before the Society a summary of the operations of this body in the past twelve months.

The Association was the means of obtaining a Parliamentary return on the working of the Smoke Prevention Nuisance Act in the metropolis, which shows how ineffectual it is. It appears that nearly all apparatuses for consumption of smoke are alike permitted, many of them being totally useless.

The question of diseased meat occupied the attention of the Association, partly brought to its notice by Dr. Letheby's regulations in the City, and partly by a paper from Professor Gamgee, of Edinburgh.* The Association was of opinion that one great desideratum, was the ascertainment of facts as to the real effects produced by eating the flesh of diseased animals; and another a systematic inspection of all

* Professor Gamgee's paper was published in the Edinburgh Veterinary Review for March 1862.

carcasses at the slaughter houses, because diseases can frequently not be detected when the meat is cut into joints, and the carcass removed. Such an inspection would be greatly facilitated by the discontinuance of private slaughtering, and the use of abattoirs only.

The Association waited on members of the Government and others, respecting the Metropolis Local Management Act, and and more particularly in reference to the amount of free space around new buildings, to overcrowding, water supply, and the removal of manure. The suggestions of the Association appear to have been influential in securing the insertion of clauses for the several objects aimed at.

A deputation waited on Lord Palmerston, to represent the importance of the systematic sanitary inspection of public schools; urging that many epidemic diseases are propagated at these schools from want of proper precautions, and that physical training is often greatly neglected, to the impairment of the pupils' health. Lord Palmerston admitted fully the importance of the object, and referred the Association to Lord Granville. The secretary has twice applied to his lordship to obtain an interview for a deputation, but from some cause has received no reply.

During the last three months, a thorough inspection of all the cowsheds in the metropolis has been carried out in connection with the licensing which is now required for all places used by dairymen for keeping cows.

This provision, introduced into the Metropolitan Local Management Amendment Act, at the suggestion of the Association, is considered a very important one, as tending to discourage the keeping of cows in the more densely peopled parts of town, and ensuring a greater regard to the salubrity of the sheds, thereby obtaining a more wholesome supply of milk, and preventing the nuisance which has been caused, by the dirty condition of the sheds, to adjoining premises.

The working of the new regulation will much depend on the Local Boards and the magistrates, many of whom seem disposed to help in the matter.

EPIZOOTICS.

The chief diseases which have prevailed among domesticated animals during the past twelve months have been, as Professor Simonds informs me, epizootic pleuro-pneumonia and the vesicular disease of the mouth and feet. Many sheep have also suffered and been lost from *filariæ* in the bronchial tubes and true digestive stomach; and several local, but very fatal,

outbreaks of influenza among horses, and an outbreak of *variola ovina* in Wiltshire, have also occurred.

At the beginning of the year, the vesicular disease of the mouth and feet (epizootic eczema or aphthæ) prevailed very extensively in London dairies, and milk vendors had great difficulty in supplying their customers. The veterinary journals published during the twelve months relate several instances of this disease being communicated to man by the use of milk taken from animals suffering from the affection. Professor Gamgee expresses the opinion that the use of milk from such a source is more frequently the occasion of eruptive diseases in children than is commonly supposed. Mr. R. H. Watson, of Kelso, relates examples of extension of the disease to calves fed with the milk of affected kine; also to several farm servants and children. In both animal and human patients there was much gastro-enteric disturbance, which ceased when the use of the milk was given up. Mr. Duncan, of Colnsburgh, Fife, records the case of a lad suffering from a vesicular affection of the mouth, and being ill for a fortnight, after using the milk of an aphthous cow; and M. Guillmot,* a French writer, records several similar instances.

I have already noted, from the Scottish Registrar-General's quarterly reports, an opinion that the prevalence of diphtheria and aphthous mouths and throats in man, since the wide spread of epizootic aphthæ among cattle, were closely connected with, if not due to, the use of milk from kine affected with the malady. Dr. Stark is wishful that I should direct the attention of the Society particularly to this question. In a note to me, he says—"These diseases are no doubt identical, and every effort ought to be made to second Professor Gamgee's efforts to get Government to interfere to prevent the importation of live stock from the continent, and also to pass stringent laws for the prevention of the spread of the diseases among cattle in this country."

Typhous influenza (so-called) was prevalent among horses in several districts of the kingdom at the close of last, and beginning of the present year. In one outbreak in Derbyshire the disease was characterized by a pulse varying from 60 to 120 per minute; respiration much accelerated, and 60 in the minute; visible mucous membrane, of a yellowish red colour; mouth hot and dry, emitting a fœtid odour; loss of appetite and great thirst; slight catarrhal symptoms; bowels much constipated; and loss of motor power. The horses obstinately

* Edinburgh Veterinary Review, April 1862.

stood for five or six days; in many cases partial paralysis of one or both hind extremities supervened; and occasionally the brain became disordered. The malady was very fatal.

In the distemper as seen in Lincolnshire the pulse ranged from 40 to 70; lining membrane of nostrils hot and injected; mouth hot, white, and very dry, emitting a fœtid odour; total loss of appetite; no desire for drink; slight change only in the respiratory organs; no cough; no catarrh, as in ordinary influenza; duration of disease about ten or eleven days, the whole of which time the animal stood. Constipation a marked symptom for several days. Twenty-five horses were lost on one farm.

Typhoid fever (?) was noted among domestic animals, particularly sheep, by Mr. S. Brown, V.S., of Melton Mowbray, contemporaneously with an outbreak of typhoid in man, in the same locality.*

The outbreak of *variola ovina* in Wiltshire, which caused so much alarm among sheep-farmers at the beginning of summer, happily appears to be dying out. The origin of the disease is obscure; but it is surmised that it was introduced into the farm where first observed by means of skins of foreign sheep imported to Bristol whilst suffering from the affection, and killed there. A canal passes through the farm referred to, and it frequently happens that boats laden with skins traverse it. At the time when the disease is presumed to have infected the flock first attacked, the sheep were feeding in the vicinity of the canal. Much discussion has taken place on the respective values of "separation" and of inoculation in the protective treatment of flocks affected with the malady, and upon the influence of vaccination. Hitherto, experimental observation seemed to show that vaccination was of little or no worth as a safeguard against *variola ovina*. It was desirable, however, to have additional evidence upon this subject; and the Society will be glad to learn that a series of experiments are about to be instituted upon the utility of vaccination in the sheep, under the direction of Mr. Simon. Two hundred sheep have been purchased for this purpose by the Government, and Professor Simonds and Mr. Marson are commissioned to conduct the experiments.

Variola ovina was first introduced into England, from the continent, in 1847. After ravaging the flocks of several counties in that year and in 1848-49-50, the disease began to decline; and since 1853 no case has been recorded until the recent outbreak.

* Edinburgh Veterinary Review, March 1862.

An epizootic diphtheritic affection has recently appeared among pigs in the vicinity of Chippenham (Wilts). The malady has been confined, so far as is at present known, to one farm. This is not the only instance of the disease occurring among these animals during the year. In the January number of the *Archives of Medicine* an account is given, by Dr. Beale, of the microscopic examination of a specimen of very thick false membrane from the pharynx of a pig, forwarded to him by Mr. McCormick, of Aylesbury. "It consisted," writes Dr. Beale, "of a firm material, which was fibrillated, numerous small granular cells about the size of white blood corpuscles, and epithelial cells of various ages. From its deep surface, small funnel-shaped processes projected, to the distance of a quarter of an inch, into the follicles in the mucous membrane, at the lower part of which the multiplication of the granular corpuscles was taking place, apparently with great rapidity. It was probable that had the animal lived, the condition described would have soon given place to the process of suppuration, in which case the mucous membrane, in its entire thickness, would have been destroyed."

A catarrhal affection among domestic animals, running in some cases into diphtheria, is recorded by Mr. Chapman, V.S., of Gainsborough, Lincolnshire;* and in the recently published volume of the Pathological Society's *Transactions*, an example of supposed diphtheritic disease in doves is reported.

In an important paper, by Professor Gamgee, "On the Health of Stock," published in the *Edinburgh Veterinary Review* (March 1862), and in which information on this subject has been collected from all parts of the kingdom, the great moment of an annual report of the status of disease among domesticated animals is most forcibly shown. The extraordinary mortality in our stables, cow-houses, and sheep-folds, at a time when the diseases chiefly prevalent among animals are not exciting much public attention—when, in fact, such diseases are in a comparative state of quietude—thus brought to light is startling. One example will suffice to show this. The information furnished to Professor Gamgee on the state of health among cows in large towns leads him to the conclusion that 33⅓ per cent. die annually from disease,—that is to say, a loss of 330⅓ in 1,000, or upwards of 3,330 per 10,000. "If," he says, "our sanitary reformers are alarmed at a mortality of 200 persons in 10,000, what will they say to more *than sixteen times that amongst our poor cows.* Every

* Edinburgh Veterinary Review, March 1861. p. 169,

town" (he adds) "may have an annual dangerous visit by the foot and mouth disease, without much raising the mortality list, but seriously deteriorating the milk supply."

A curious and fatal outbreak of apparently a choleraic affection among the East Lothian foxhounds, is recorded by Professor Gamgee, senior, in the last (November) number of the *Edinburgh Veterinary Journal.* I merely refer to the outbreak here, as subsequent researches may throw a greater light upon the causes of the attack than has yet been obtained.

At the meeting of the British Medical Association in August last, Dr. Budd, of Bristol, read a paper entitled, "On the Occurrence, hitherto unnoticed, of Malignant Pustule in England." He pointed out that continental physicians seemed to have concluded that malignant pustule is identical with the fatal and very contagious disease, called in oxen "charbon," in sheep, "sang"—the disease being common among oxen and sheep in England, and known among the farmers as "joint murrain," black quarter, or quarter evil;—that the disease is communicable to man by direct inoculation, and by eating the flesh of animals killed while affected by "charbon;"—and, further, that the disease may be communicated from man to animals. Dr. Budd briefly related nine cases to show that the disease was not so uncommon in England in man as had been supposed. He described the onset and progress of the disease. In all cases it began merely as a small, and apparently harmless pimple on some uncovered part. For several days the disease was purely local, and by excision of the part it had been found, in the practice of foreign physicians, that general infection was prevented. If, however, the disease be left to run its own course, general constitutional disturbance and well-marked symptoms of septic poisoning set in. The local symptoms are great swelling and blackening of the surface; the tissues also become very hard, and in one instance, on incising a lip affected with the disease, it cut with a creaking noise. All the cases terminated fatally within a period ranging from the fourth to the eighth day. Dr. Budd had obtained particulars of fourteen other cases. In two of the series, the disease seemed to have resulted from the bite of a gnat; in another, from handling a diseased carcase of a sheep; in three others, it occurred in persons whose occupation brought them in contact with sheep and bullocks. In the remaining instances, nothing was made out as to the possible origin of the disorder. Dr. Budd dwelt on the necessity of more stringent measures to prevent the sale of diseased meat. The flesh of animals killed whilst suffering from "quarter evil," is

often sold. His experiments had shown that the temperature at which meat is cooked is not high enough to destroy animal poisons.

In April last, Professor Gamgee, in a paper entitled, "Is the Produce of Diseased Animals Unwholesome as Human Food?" read before the Metropolitan Association of the Medical Officers of Health, directed attention to the possible occurrence of malignant pustule in man, in this country. Contrary to the commonly received opinion, he pointed out that the epizootic disease was far from unknown among us. The "braxy" in sheep was the same, he said, as the *miltzbrand* of the Germans, and the *fievre carbonculaire* of the French; and black quarter, quarter evil, quarter garget, black leg of many parts of the United Kingdom, is the malignant anthrax of France, Germany, Italy, and many other warmer countries than ours. This he states from personal experience. "The warmer the climate," he says, "the more common and deadly is anthrax; and there are countries, such as our own, where the disease is seen, but is rarely attended with the development of the anthrax poison."

His observations led him to the conclusions, that—

"1st. The malady described by continental authors as anthrax or carbuncular fever, and which attacks man and all warm-blooded animals, occurs in Great Britain.

"2nd. The anthrax poison induces malignant pustule in man, but with a very different degree of severity in different cases. A certain temperature is essential for the development of this poison, and from this circumstance it only occasionally manifests its virulent properties in this country. This poison may act with great violence on the unabraded skin, or on being introduced into the blood by a wound, or into the stomach, especially if the flesh be raw.

"3rd. The disease in man, produced by eating the flesh, may sometimes be a diarrhœa, but more frequently a form of putrid fever, with malignant pustules on different parts of the body.

"4th. The *post-mortem* appearances in animals that have died of this disease are often localized in one quarter of the carcase, which may be removed, and the other quarters sold, much to the danger of human life. This indicates how necessary it is to have professional inspectors to slaughter houses."

Since the publication of Professor Budd's paper, it has been stated that cases of malignant pustule were recognised and treated in St. Bartholomew's Hospital, several years ago.

A French writer, M. Conté (*Clinique Veterinaire*, June 1862), insists that splenic apoplexy—the *sang de rate*—

which has recently begun to excite considerable attention among the herds in this country, is a charbonous affection. Professor Gamgee, in the paper referred to, remarks that "It is difficult to say if splenic apoplexy may not occasionally assume all the virulence and characters of anthrax." M. Conté writes:—"The nature of splenic apoplexy is clearly revealed by cadaveric autopsy; the blood is found everywhere black and disorganized; this black, pitchy, putrid mass distends the spleen, and is accompanied by gelatinous infiltrations of a citrine colour, disseminated over the divers regions of the body. Finally, the short duration of the malady, and the speedy putrefaction of the dead bodies, all concur in establishing the essentially charbonous character of the malady. To those who have still a doubt, I would observe that the blood retains its putrid malignant character till after death. Thus it has happened that shepherds and butchers have been affected with malignant pustule after having skinned animals which had died of this disease. Many people have assured me of their having suffered from gastric derangements, and from the appearance of malignant pustules on different parts of their bodies, after having eaten of the meat of animals which had been slaughtered on being affected with this enzootic."

Important reports on *Splenic Apoplexy* among certain herds in this country, were laid before the Royal Agricultural Society in July last, by Professors Simonds and Buckman, and Dr. Voelcker.*

EPIPHYTICS.

The information I possess on epiphytics is most meagre. The epiphytology of the twelve months may be summed up in the words of the editor of the *Gardeners' Chronicle, and Agricultural Gazette.* He writes me—"There has been no special disease this year among plants, except what remains of the potato disease."

In the Southern Counties wheat was affected a good deal with the "red gum," and the crop suffered more or less from "rust" all over the kingdom, but not to any very injurious extent. The turnip crop in the Midland Counties is now affected with a disease, said to be the result of the ravages of certain aphides.

* See the Veterinarian for August.

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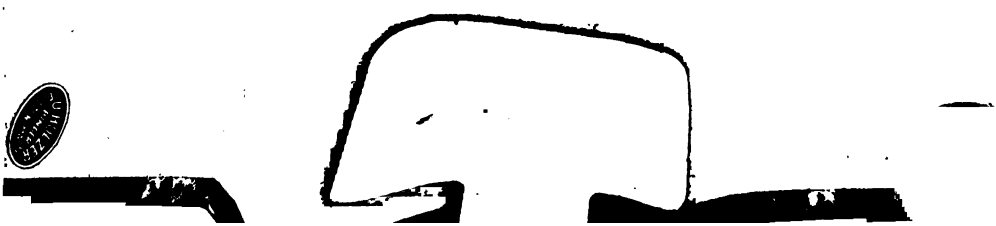

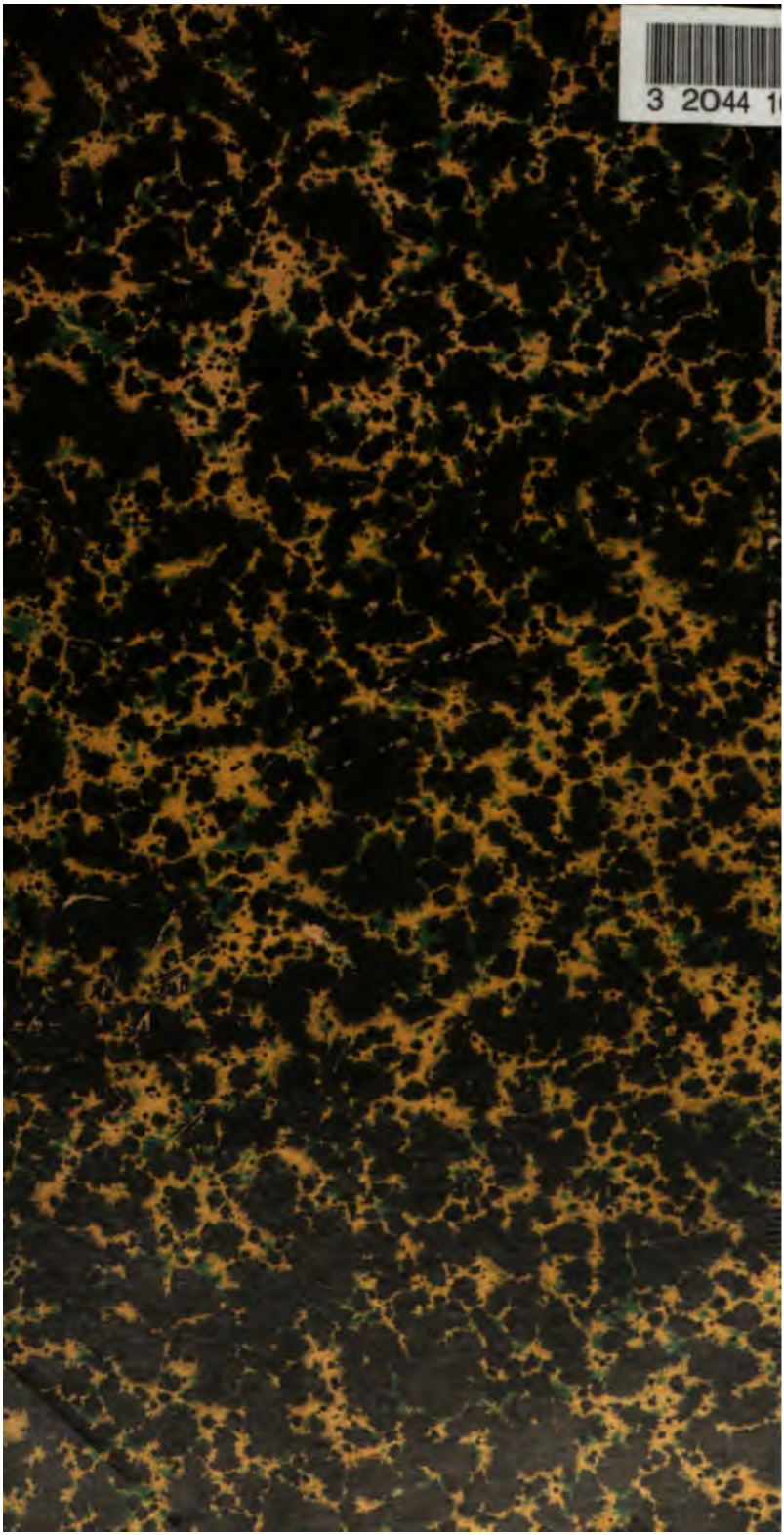
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